

REPORT
OF
THE EIGHTH
INDIAN INDUSTRIAL
CONFERENCE

HELD AT BANKIPORE

ON THE

30th December 1912.

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INTRODUCTION.

'A careful examination of all the factors, that help production, cheapen distribution, avoid waste of commodities and energy (both human and physical) and reduce the drain, is needed. A thorough study of conditions, political, local, religious, educational and moral has to be made so as to effect the economic elevation of the country.' (*Presidential address of Lala Harkishen Lal*, p.XVI.)

'Never was there an age full of great social problems as ours; surely they are not unworthy of the best efforts of the best minds among us. Think of the force that University men might bring to bear by their personal influence, if great numbers of them had learnt to think clearly and had studied the age in which they live. They might then take a wise, an active part in relieving misery without making pauperism; in helping the people to educate themselves and rise to a higher level; to become not only more efficient producers but also wiser consumers, with greater knowledge and greater love of all that is beautiful.' (*Ibid*, P. IXV.)

'At almost every point, it is true, the hand that does the material work is the hand of an Indian. But—be the reason what it may—at most points still the head that has organised and the voice that has taught, have been those of the European. It will not always be so; but it still is true. And there is no lesson that I have learned more clearly by my examination of the industries and trades of India than this. If we are to do justice to the country we must work together, European and Indian, at the tasks we respectively do best. Jealousy or exclusiveness by one or other at this stage of our country's development must have consequences as ruinous as estrangement between old and tried partners who know each other's worth. (*Frederick Nael Paton Esq.*, p. 196.)

In conformity with the annual practice, the Eighth Session of the Indian Industrial Conference was held at Bankipore on Monday the 30th December 1912, in the Congress Pandal. The attendance consisted of notable representatives and leaders of different Provinces as well as sympathisers with the aims and objects of the Conference movement. The Conference was also fortunate in securing as its President Lala Harkishen Lal, B. A., Bar-at-Law, of Lahore, whose election to this honour was amply justified by his masterly address, which for its breadth of view and exhaustive treatment of the present economical position of India, was highly appreciated by his countrymen. The address will be reckoned as a valuable contribution to the Conference literature and can be ranked

with some of the best utterances from the Conference platform. It may be in the recollection of our readers that Lala Harkishen Lal was the Chairman of the Reception Committee, of the 5th Indian Industrial Conference, which met at Lahore in December 1909. The address of Lala Harkishen Lal which covers about 55 pages of small type partakes more of the nature of a treatise on the general economic position of the country than a Presidential utterance. It is therefore, not possible to do justice to its varied contents, within the circumscribed limits of an introduction. At the very out-set, Mr. Harkishen Lal proves with the aid of statistics that the state of the multitude of men, women and children in the country is "a little below the most meagre comfort and a little above the nearest road to starvation" as observed by a recent visitor from the British Isles. In India, large savings of capital are not possible, unless Agriculture is carried on with the aid of more improved methods and on a more extensive scale and labour was drifted partially from Agricultural to Industrial pursuits. Other sources of income like the forests, mining, the fishery and commerce deserve also to be systematically exploited and sedulously pursued.

In the opinion of Mr. Harkishan Lal, the following factors are essential for the improvement of Indian Agriculture in addition to copious water supply by artificial means :—

- (a) Leaders should equip themselves with practical knowledge of modern up-to-date methods in Agriculture. This can better be accomplished by the establishment of Agricultural chairs in connection with the Indian Universities.
- (b) Spirit of emulation among farmers by organising fairs, of Agricultural produce, village arts and industry, cattle shows and other means.
- (c) Co-operation in cultivation, harvesting, marketing as well as in credit.
- (d) Attempt to export manufactured products instead of raw materials. For instance, flour and not.

wheat, oil and not oil-seeds, ginned cotton, dried fruits and preserved vegetables.

(e) Use of approved manures.

(f) Provision for the supply of forage and other food stuffs for the cattle.

In regard to handi-crafts Mr. Harkishen Lal thinks that the care of Government and of the patriots is required not only for the mill hands but also for the other large multitudes that still subsist by handi-crafts, which are at present learnt in the majority of cases under circumstances not favourable to improvement. It is the bounden duty both of the state and the people to try their best to preserve the decaying industries of the country from death and with the aid of better tools and better organization for marketing to renew the lease of their life.

The president next passes on to the consideration of the Jute Mills, and points out that out of the 38 Mills not a single one is managed or financed by any Indian. "Here is," says he, "food for reflection for all, who are anxious to advance the cause of Indian Industries."

The Cotton Mill Industry being the largest with prospects of further growth and expansion has naturally received a fuller treatment at Mr. Harkishen Lal's hands. "So long" says Mr. Harkishen Lal, "as the freights on fine American Cotton remain against us, *prima facie* for finer goods, India must always depend on foreign countries. To remedy this state of things, cultivation of finer stapled cotton or the invention of the machinery to produce finer yarn from the present quality of cotton are the subjects which deserve the earnest attention of leaders in the country apart from the question of protection." Any success in the improvement of quality of cotton will benefit not only the Weaving Factories but also the hand-loom industry which has now to depend so largely on foreign yarn. England's supremacy in point of excellence of her cotton fabrics is due to several causes which may be summarised thus :—

- (1) Combinations to grow cotton for mills.
- (2) Technical Institutes and laboratories to improve the knowledge and the skill of the workman.
- (3) The Primary cost of machinery, and appliances, sundries and accessories is much less in England than in India.
- (4) The labour is more efficient.
- (5) Power of Lancashire Mill-owners to influence the Government to suit their own requirements.
- (6) Establishment of separate associations for watching the interest of various matters connected with this industry.

After the models of the English institutions, Mr. Har-kishan Lal suggests the formation of an association with headquarters at Delhi, the membership of which should be open to all the mills in India. In addition to this, there should be associations of people for growing, buying and selling cotton and also one or more Institutes of Mechanical Engineers, Carding and Spinning Masters. There should be also Banks specially organised for financing cotton trade and manufacture.

From cotton he proceeds to the consideration of smaller industries : Paper making, brewing and weaving of wollen cloths are at present mainly in the hands of European capitalists. Whereas Flour Milling, Oil crushing, Cotton ginning, Glass-making and a few other industries are in the hands of Indian capitalists. Indifferent success in some of these Indian ventures is due to various causes which it is the duty of every enlightened Indian to investigate and to communicate the result to the office of the Industrial Conference which has also taken upon itself the investigation of this important question ; want of sufficient capital, employment of inefficient and inexperienced staff, absence of business knowledge, want of honesty are the main causes which have contributed to the failure of so many concerns.

The conditions which have favoured the growth of industrialism in foreign countries have been stated by Mr. Har-kishan Lal thus :—

1. Discoveries of Science, which were always utilised in practice.
2. Application of machinery, which was invented, made and used as needs arose.
3. Utilisation of coal and water or other powers of nature, to reduce the cost of production by reducing the labour bill.
4. Factory system ; Associated efforts.
5. Easy and cheap transport, by land and water.
6. Commercial and Industrial enterprise throughout the peoples of the country.
7. Division of labour, which helped specialisation.
8. Cheap and sufficient capital.
9. Favourable and helpful attitude of governments, at home and in international relations.
10. Adaptable social and religious systems, to help in the readjustment of new factors.
11. Co-operation of women folk, who in the East act, sometime, as a brake on the wheel.
12. Competition, and avoidance of competition as required by the dictates of prudence and wisdom.
13. Combinations.
14. Utilisation of By-products.
15. World Markets.
16. Literary assistance.
17. System of Insurance against the risks of fire, water and earthquakes.
18. Simultaneous growth in all directions, and
19. Latterly Technical Education.

Capital, skill, labour, market and fiscal autonomy, the requisites of production have been next dealt with.

For the accumulation of capital we must save, invest and organise, and in order to induce foreign capital to flow into purely Indian or mixed concerns, the best way would be to introduce large and well considered schemes with mixed Boards ; schemes which are aided by Government or aided by Native States or local bodies will naturally have a better chance.

It behoves us also to establish a sound and solid system of banking, and a banking association for the discussion of questions vital to the existence, continuance and prosperity

of the banks. A very useful Banking system could be devised with the aid of Native States somewhat on the lines of Presidency and Discount Banks combined. For the healthy development of Insurance business which is an indirect method of collecting capital, the President recommends the formation of an association covering all departments of risks. Says he :—

“ The country is vast, the population is large, the ills and risks to which it is subject are more numerous than anywhere else ; therefore it stands in greater need of real protection by insurance, than the population of any other country. Afford real protection to all ; and indirectly bring together small sums of money to swell into much. This will form a rich source for collecting capital.”

Another way of collecting capital is the spread of Village Urban Banks through the Co-operative Societies.

The President suggests that Government should start *Pioneer* Factories for the production of such articles as are largely used by its departments and after a while these concerns should be handed over to the people on payment of a portion of the money in hard cash and the balance by way of deferred-payment debentures. This, according to him, will be a better way of introducing new industries into the country. Mr. Harkishen Lal acknowledges that “Swadeshism or the love of the country on its material or prosperity side is a noble and effective force” ; and can be translated into direct money contributions to form a nucleus of capital for initiating new industries, introducing young men into business careers as opposed to mere literary professions. With regard to skill the President has the following observations to make :—

“It is technically termed *skill*, but includes a multitude of requirement. In this connection our attention should not be focussed on mere steam power factories, but on all factories, big or small, hand-worked or power-worked, which are engaged in the processes of manufacturing useful articles of food, apparel, habitation, enjoyment, transport, and intellectual and physical advancement. We find, by comparison, that both *hand* and *power* productions of India are much inferior to those of Europe, America and Japan in the following respects. They are poorer in design, execution, and finish ; and therefore they fetch less value, and are much less appreciated ; and they are hardly able to hold a place before similar articles of foreign manufacture ; let the better and older organisation and the world-marketing be accepted as factors against us, but still there is no reason why India should not be enabled by training, to

manufacture some of the articles at least, for which she has her own raw materials ; for which immediate need for deep scientific knowledge does not exist ; and for which she can, even with her scanty resources, find the required amount of capital ; and lastly, which her own sons, if better trained, could manufacture."

Mr. Harkishenlal has very ably discussed the question of the duties and the responsibility of a Government for ensuring the prosperity of its subjects. He argues that "the conception of the functions of the state in these days is quite different from what it was in ancient times". In modern times subject races have been admitted by all great powers to a share in the administration of their own affairs. Again the State Revenue does not consist merely of taxes raised but includes profits of large monopolies like the Railways and Irrigation schemes in India. The Indian Government is, therefore, responsible not only for internal peace but also for the prosperity of millions of her subjects. While discussing this point, he tries to answer the question as to the extent or limit to which prosperity be vouchsafed by each Government. A reasonable answer to this question of course is that the standard of prosperity of the people of India should not be lower than that of the citizens of any other country. This is the solution of the whole problem in a nutshell and it is to be seen how far the Government of India is prepared to accept this view.

For the promotion of Technical Education in the country, Mr. Harkishen Lal proposes that after the models of Directors of Public Instruction, Assistant Directors of Public Technical or handi-craft Education should be appointed for each Province whose duty it should be to do every thing required for the establishment of such schools and for their further growth to suit the changing needs, habits and ideals of the people.

While commenting on the Report submitted by Lt. Col. Atkinson and Mr. Dawson on the prospects of technically trained students in India, Mr. Harkishen Lal expresses his opinion that the scope of the inquiry was very limited and the recommendations of the Committee "as far as Indians are concerned are not whole-hearted and positively disheartening".

The President next urges on the educated people the need of developing the foreign commerce of the country. He believes, that commerce is easier than manufactures in the face of competition and jealousy of the trade, the difficulty of languages, the social habits of the people, vested rights and special privileges of certain firms and business concerns, as apart from England, several other countries are evincing a keen desire to push forward their oriental commerce. In the opinion of Mr. Harkishen Lal.

"The advantages of adopting a life of commerce would be many; as in addition to pecuniary advantages, to which all economic life aims, we will be able to buy in the cheapest market, and to sell in the dearest; we will learn what other people want from our resources, natural and manufactured, and we may tap, to our advantage, resources and sources hitherto unknown to us. We will also have opportunities to gain experience in methods of business, of large organizations of advanced countries, which experience, unfortunately, cannot be made available for a sit-at-home Indian or even to a traveller. We may friends abroad, to help us with capital, knowledge, and materials. This may lead to partnerships and associations beneficial to both the parties."

Mr. Harkishen Lal bitterly complains of the system or rather want of system in handling traffic by the Indian Railways and urges that it should be entirely changed and citing in support curious anomalies of existing Rates, and the delays that are caused to trade by shortness of waggons, preferential treatment and want of time limit. To remedy these evils he advocates the formation of a traffic board consisting of Indian and European members.

In concluding his address, the President has made some 15 suggestions which will be found to reproduce under "Summary of proposals" which follow this introduction.

The usual presentation of the annual Report on the work of the Industrial Conference Office by the General Secretary was followed by discussion of the various Resolutions which were submitted to the Conference, full details of which will be found in the proceedings.

The number of papers received this year was nearly the same as that of last year. Before taking as usual a general survey of these contributions, by official and non-official gentle-

men, some of whom attended the conference for reading their own papers, a word of apology is needed for the promiscuous way in which they are printed in this Volume. It is the yearly experience that papers come in upto the last moment and have to be sent to the Printers as they come to save delay, in the order of the dates of their receipt; hence it is not possible either to classify them according to their subject matter or in the order of the position of their writers. In this introduction, however, an attempt has been made to treat the different papers, under their respective groups due prominence being given to the contributions from Government officials according to the position of the writers. To facilitate reference the page of each paper is quoted.

In the list of papers, the place of honour may appropriately be given to "Work-a-day India" contributed by Mr. Frederick Noel Paton, Director General of Commercial Intelligence, India, in which the author graphically describes a few impressions of the work-a-day India gathered by him during his visits to most parts of the country when he had opportunities of seeing trades and industries in operation and talking with most of the leading men conducting them. This essay presents a kaleidoscopic view of the industrial and commercial activities of the whole country and the degree of organisation which is perceptible all round and doubts "whether the day has not gone past for speaking of India as if it were still a material". The organisation is not realised by persons abroad who are disposed to gauge Indian organisation by Western tests and conclude that any system which is different from theirs must of necessity be inferior in efficiency, and this opinion of foreigners leads Indians without foreign experience to look upon their own efforts to be inefficient being less uniform. To remove this erroneous impression and infuse more hope is the main object of this paper. To quote Mr. Noel Paton:—

"Go where you will, you find the rising stream of skill and welfare creeping across the country; and it is our task to lead it in the right directions as an irrigation officer conducts his fertilizing flood.

But please understand that my intention to-day is not to instruct. My purpose is one that would be much better performed by a cinematograph. I

want to call up before you a set of pictures of a few characteristic industries and trades in India and to leave you, if possible, with a greater pride in our country than before, and a deeper respect for that co-operation of East and West by which we have advanced so far and without which we should go no further. Nothing could testify more strongly to the desirability of a partnership between the resourcefulness of the Britisher and the adaptability of the Indian than the accomplished evolution of commercial and industrial methods possessing all the flexibility required in a country like this." (p. 185)

Calcutta "with its teeming river, its jute, coal and tea", Bombay with its "enterprise and self-confidence and its magnificent harbour," Madras "with its growing port accommodation its multifarious industries," Karachi with an oasis of sunbaked brick and superb bumptiousness," Rangoon "with its golden pagoda gleaming through the smoke of a hundred Rice Mills and Steamers," Cawnpore versatile in enterprize, Delhi, "the Indian prototype of Rome" have all come under the keen observation of Mr. Noel Paton, who has confessed to his inability to give even the vaguest impression of the magnitude of India's economic phenomena or of the skill, patience and enterprise that are visible even in the remotest corner of the Indian continent.

While on this subject, the writer admits that in some places the complex and obscure nature of the weights and measures puts too much power into the hands of the broker to the disadvantage of the producer and records his experience that the merchants themselves had raised this question in their conversation with him—a sure sign that the movement for the unification of weights and measures is gathering strength not out of any "theoretical predilection" but from the realisation of actual inconvenience and waste involved.

As agriculture has remained and will probably remain till end of time the main industry even in countries noted for their manufacturing activity, it naturally arrests our attention and agriculture and its allied industries deserve to be given a prominent place among the subjects contributed to the Conference.

The only paper directly dealing with agriculture has been contributed this year by Mr. V. G. Kogekar, organiser, the Decan Agricultural Association, Poona (Page 206). "The utility"

says Mr. Kogekar, "of properly worked Agricultural Associations is no longer a subject of dispute." There is thus a necessity of an organization, which will serve as a link between Government Agricultural Departments on the one side and the cultivating classes on the other, it being essential that individual members of these Associations should work with some zeal. In the Marathi speaking tracts of the Bombay Presidency there are according to this writer 29 Agricultural Associations, of which 17 are located in 5 Districts of the Central Division, *viz.* Poona, Satara, Sholapur, Nasik and Ahmednagar. It appears that the majority of these Associations are doing yeomen service by introducing among the farmers some very useful and practical improvements, *e. g.* (1) the proper method of preservation of cattle manure, (2) selection of seed, (3) use of insecticides against diseases of crops, (4) cultivation of new and profitable varieties of groundnuts, cotton, wheat and other crops, (5) experiments in green manuring with san for paddy.

Intimately Associated with agricultural improvements is the work of Co-operative Societies, which are increasing with rapid strides since the passing of the Co-operative Credit Societies' Act of 1904. The paper of Mr. Mohi-Uddin-Ahmed, of Behar, throws much light on this subject (P. 421). Mr. Ahmed defines a Co-operative Society as an Association or Combination of persons having mutual regard for and knowledge of one another, who jointly pledge their credit in order to raise sufficient fund on cheaper terms for the purpose of lending out amongst themselves than each could obtain by pledging his individual credit. The author then proceeds to give instructions as to how to form these Societies, describes privileges they enjoy, their duties after registration, methods of conducting the business and the difference between borrowing from these Societies and from a Marwari or Mahajan and the benefits moral and economical which they confer on their members.

We now proceed to the two papers received this year on cotton industry. The first is by Mr. H. R. Pitke, Prices Current Inspector on cotton manufactures in Berar (P. 321). Mr. Pitke describes the three principal varieties of cotton in C. P.

want to call up before you a set of pictures of a few characteristic industries and trades in India and to leave you, if possible, with a greater pride in our country than before, and a deeper respect for that co-operation of East and West by which we have advanced so far and without which we should go no further. Nothing could testify more strongly to the desirability of a partnership between the resourcefulness of the Britisher and the adaptability of the Indian than the accomplished evolution of commercial and industrial methods possessing all the flexibility required in a country like this." (p. 185)

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The only paper directly dealing with agriculture has been contributed this year by Mr. V. G. Kogekar, organiser, the Decan Agricultural Association, Poona (Page 206). "The utility"

says Mr. Kogekar, "of properly worked Agricultural Associations is no longer a subject of dispute." There is thus a necessity of an organization, which will serve as a link between Government Agricultural Departments on the one side and the cultivating classes on the other, it being essential that individual members of these Associations should work with some zeal. In the Marathi speaking tracts of the Bombay Presidency there are according to this writer 29 Agricultural Associations, of which 17 are located in 5 Districts of the Central Division, *viz.* Poona, Satara, Sholapur, Nasik and Ahmednagar. It appears that the majority of these Associations are doing yeomen service by introducing among the farmers some very useful and practical improvements, *e. g.* (1) the proper method of preservation of cattle manure, (2) selection of seed, (3) use of insecticides against diseases of crops, (4) cultivation of new and profitable varieties of groundnuts, cotton, wheat and other crops, (5) experiments in green manuring with san for paddy.

Intimately Associated with agricultural improvements is the work of Co-operative Societies, which are increasing with rapid strides since the passing of the Co-operative Credit Societies' Act of 1904. The paper of Mr. Mohi-Uddin-Ahmed, of Behar, throws much light on this subject (P. 421). Mr. Ahmed defines a Co-operative Society as an Association or Combination of persons having mutual regard for and knowledge of one another, who jointly pledge their credit in order to raise sufficient fund on cheaper terms for the purpose of lending out amongst themselves than each could obtain by pledging his individual credit. The author then proceeds to give instructions as to how to form these Societies, describes privileges they enjoy, their duties after registration, methods of conducting the business and the difference between borrowing from these Societies and from a Marwari or Mahajan and the benefits moral and economical which they confer on their members.

We now proceed to the two papers received this year on cotton industry. The first is by Mr. H. R. Pitke, Prices Current Inspector on cotton manufactures in Berar (P. 321). Mr. Pitke describes the three principal varieties of cotton in C. P.

and Berar, with the spinning capacity of each. Some of the varieties ripen in five months, whereas there are others which take nearly 8 months. The writer has tried to demonstrate with the aid of figures the rapid growth of cotton cultivation in these Provinces as contrasted with Bombay, the castes engaged in the weaving industry the kinds of articles they manufacture at some of the important centres with the aid of improved as well as old fashioned hand looms, and also the work done by the three spinning and weaving mills and suggests some remedies for the removal of the depression of the cotton manufacturing industry in these Provinces.

The second paper is by Babu Mukhtar Singh, Pleader of Meerat, on "Cotton growing in India" (P. 390). Mr. Mukhtar Singh makes therein some very useful suggestions for sowing of cotton seed after pointing out the present defects not only in the method of growing cotton, but also in its picking ginning and other processes. The paper deserves to be carefully read by those engaged in this industry.

Sugar manufacture occupies an important place after cotton industry and has been ably dealt with by Mr. G. N. Sahasrabudde, the Sugar Expert of Poona, (Vide page 271) who was specially deputed by the Bombay Government to investigate this subject. After giving a historical sketch of the Indian industry with causes of its decline, he passes in review the conditions obtaining in Java, Mauritius and nine other countries. He also examines the four systems of Sugar and Gul making now in vogue in the different parts of our country and points out the points the defects of each.

From the foregoing we have seen that, provided there is sufficient sugar-cane supply at a reasonable rate available for a modern type Sugar Factory there is no difficulty in producing in India at a sufficiently low cost to compete with any foreign sugar. But a modern type sugar factory is not an easy affair to organise. The economical size of modern type sugar factory requires 300 to 1500 tons of cane per day. To start a medium size factory of say 600 tons of cane per day we require at least 50,000 tons of cane in a season. In a Province like the United Provinces where the outturn of cane per acre is necessarily very low (on account of climatic and other conditions) this much cane represents an area of about 3,300 acres. In order to avoid excessive transport charges this

much area must be within 35 square miles so that the mean distance of transport will not much exceed 5 miles. This thing is only possible on big irrigation canals as are to be found in the United Provinces. (p. 292.)

From the foregoing it will be seen that prospect of sugar industry in India are very hopeful provided we work earnestly on modern lines, But modern type sugar factories cannot be started in a day. It will probably be several years before we have a decent number of modern type factories. The demand for sugar in India is increasing every year by about 5,000 tons. Therefore for a good many years to come we shall have to import sugar from outside to the extent of more than half a million tons per year. Now the question is why should we import all the sugar in a refined form. Why should we not import raw sugar and refine it here as most other countries do? Anyhow we shall have to import sugar from outside for several years to come. But if we import this sugar in raw state and refine it here we shall derive at least some profit. Such a procedure will enable us to work at least 50 refineries which will be placed on the sea coast provinces like Bombay, Madras and Bengal. (p. 295.)

The next paper in this group is written by Babu Mukhtar Singh of Meerut on "Sugar Cultivation" (p. 250). In his last year's paper he dealt with different aspects of the subjects whereas in this year's paper he has restricted himself to a few practical suggestions which can be easily adopted by the agriculturists. After describing the structure of the sugarcane plant, in general, he proceeds to enumerate the specific varieties from which cuttings should be obtained. Preparation of the field for the Cane crop and the sowing of the canes and manuring Irrigation and living the breeding of canes are next dealt within detail together with the treatment of diseases of Cane crops.

We next pass on to the Paper of Mr. M. N. De on "Silk in India". Silk like lac and other commercial products is not strictly an agricultural industry but occupies a place midway between agriculture on the one hand and manufacturing industries or processes on the other hand. After tracing the antiquity of this industry which has its origin in China, the writer points out that it was probably introduced in India at a later period has been alluded to in the Vedic as well as Puranic writings. Coming down to a later period 38 kinds of Silken stuffs are, according to this writer, mentioned in the Ain-i-akabari. Bengal was a great centre of this industry for a long

time and is still noted for its different varieties of Silk. Assam is the home of Eri and Mooga Silk, whereas Behar is the distributing centre of Tussar. Factories Mirzapur in the United Provinces is also a Tussar weaving centre. The Silk Industry in Madras Presidency Central India is gradually declining and that in Kashmir is in a flowing condition and promises a rapid expansion. Mr. De concludes his essay with these practical suggestions.

Some practical suggestions are now being made:—

1. Distribution of disease-free eggs to the rearers; only licensed rearers should be allowed to sell eggs after microscopical examination. The Government must have examination offices in all the big centres of rearing where the Government officers should examine eggs free of charge or they may go from house to house examining the eggs.
2. Encouraging the rearers to rear one-brooded race in October and February and Mysore or some well-established many-brooded hybrid races in other seasons. In order to induce the rearers the eggs must be distributed free at first.
3. In a new locality where there is no sericulture castor silkworm eggs should be first introduced as this race is more hardy.
4. The appointment of circuit lecturers who have expert knowledge of sericulture for advising the people.
5. The holding of competitive sericultural exhibitions important centres.
6. The sanction of subsidies for sericultural classes in village schools, mulberry trees, cocoons, reeled thread, etc.
7. Free distribution of pamphlets in the vernacular of the district for the guidance of rearers.
8. The starting of Silk Associations whose object should be:—(a) to safeguard the interests of silk manufacturers, (b) to reply to queries regarding silk industry in general, (c) to send members to various exhibitions, (d) to bring together spinners, weavers and traders, (e) to collect and disseminate useful information and statistics regarding silk, (f) to promote technical and commercial knowledge by starting schools for rearing, weaving and dyeing in important silk centres like Bhagalpore, Berhampore, Benares, Ahmedabad, Malda, Gurudaspur, Nagpur, Madras, Bangalore, etc., (g) to induce the manufacturers and retail traders to demonstrate to the people who are carried away by gaudy colours that Indian silk goods have got their own good points specially from the point of view of price and durability, (h) to secure just and equitable relations between the silk merchants and the rearers, (i) to expand the growth of industrial art, (j) to establish Libraries and museums on sericulture in silk centres, (k) to induce Government to take up sericulture in Khas Mahals;

and Court Wards estates thus setting examples to others, (l) to impress on manufacturers the advantages of Indian as compared with other silks and to be particular about the quality of the silk exported until a silk conditioning house is established in Calcutta or Bombay by the Government, which would stop the exportation of bad silk, (m) to establish co-operative societies and guilds among silk-growers and manufacturers

9. The establishment of a central sericultural institute with branches in all the important places of silk rearing.

We now proceed to the paper of Mr. W. S. Hadaway on "the possibilities of revival of the hand printed and painted cottons of Southern Indian". The paper reveals an intimate knowledge on the part of Mr. Hadaway of the subject treated by him. The author regrets the decadence of this art and also that his own efforts "so well begun were allowed to fall into disuse owing probably to the mistaken attitude of some of the leading people towards the actual workmen. He has suggested a workable scheme which will revive this industry with even a very limited amount of capital, the market being ready. In Europe also this industry still holds its own in the face of fierce competition with machinery.

There are two papers connected more or less with the formation of Joint Stock concerns. The first is on "Banking in India" by Mr. C. Gopal Menon of Madras. "A country", says Mr. Menon, "derives from a wide-spread system of banking, facilities for the collection and distribution of capital according to the requirements of different localities." This is a very important service rendered by the Banking Companies to the economic development of their own country. Enormous commercial and industrial enterprises have become possible in America and Europe only on the strength of their banks. The best known method of exploiting capital is by the extension of the Joint Stock Banking systems, which is the only suitable system for the concentration and distribution of capital. After reviewing the various banking systems which were in vogue in the country before the establishment of the several chartered or Presidency banks, the author has given an idea of the methods of work of the Native Bankers, the English Exchange bank

and the Indian Joint Stock Banks and other much valuable information about Banking systems and their importance in the economical development of a country.

Along with Mr. Menon's paper may be read with benefit the contribution of Mr. H. R. Crosthwaite on "Unlimited Liability as a national asset." (P. 197) "India" says Mr. Crosthwaite "is a country of small units, a vast rural area of small villages, small holdings, small dealings, small incomes." These units, however, when put together make up a large aggregate. The commercial position of India, which absorbs without effort one-fifth of the whole world's output of gold is a factor to be counted with. The aim of social reform should be to elevate the moral character and improve the skilled capacity of a people. According to this writer, the state must be moulded by its citizens and not the citizen by the state as is held by some confused thinkers. This being the principle on which the co-operative movement in India is based, it has naturally achieved so much success within such a short time. With these prefatory remarks the writer proceeds to describe the part played by the unlimited liability system as applied to the Co-operative Credit movement and in conclusion exhorts the people to adopt Co-operation, if they wish to keep their place in the race for commerce.

"Law of Trade-marks in British India" is the theme selected by Mr. S. Krishnamachariar for his paper. (P. 298) After defining "Trade-mark" and "Property-mark" he has brought into prominence the fact there is no proper system of registration of a Trade-mark in India and no provision for a statutory title to it—a defect which interferes with the acquisition of an exclusive right to the manufacture of any particular goods or articles and it thus discourages any new inventions or enterprise. The author has cited several cases in support of his contention and has treated the subject in all its legal aspects, which owing to their technical character would be rather perplexing to a layman.

In the next paper, Dr. N. Kunjan Pillai, Director of Agriculture, Travancore, gives a very connected account of the

“Development of Industries” in that state (P.1). It appears that although very little was done by the state up till now for the industrial advancement, still there are unmistakable indications that the state authorities are awakening to their responsibility in this matter. Weaving, Lace and Hosiery making, oil pressing, Coir making, sugar refining are the chief industries. Travancore is the home of the Coconut and there is a large export trade of this product in its numerous forms. The paper is full of practical suggestions both to the people and the Government of the state for exploiting its natural resources.

Professor P. G. Shah of Lahore, who has already won two or three prizes from the Bombay University for his essays on economical subjects, placed this year at the disposal of the Conference his monograph (P.19) on “Copper and Brass Industries of India.” It is a very carefully prepared essay revealing an amount of industry and perseverance on the part of its writer, whose efforts ought to stimulate other writers in the country, to follow his example. The paper traces the origin of the copper and brass vessels in India and the use of other metals, like, bronze tin, and tin alloys, describes how the religious notions both of Hindus and Mahomedans affected these industries, mentions the castes employed in this business in the different parts of India and the general tendencies of its organisation and methods of manufacture. These and various other questions too numerous to be noticed in detail in this place, have been fully discussed by Mr. Shah in his paper, which is a store-house of information on the subject, and is replete with suggestions for its improvement.

In his Paper on “Co-operative Village Libraries” (P.77) Prof. J. N. Samaddar who writes almost every year for the Conference, puts in a plea for the establishment of libraries for benefit of the people of villages on Co-operative basis, which ought to aim not only at the production of wealth but what is more important still—the social and intellectual welfare and also to broaden the mental horizon of the masses. To secure this end,

Mr. Samaddar suggests that such Libraries should be started along with the other items on the programme of work of the Co-operative Societies. The nucleus of a small library should at the start be utilized for the benefit of the rayats, the Secretary of the Society or a few members of the Village Panchayat should undertake to read useful books, magazines or weekly papers aloud to the Village folk regularly at some convenient place.

Those who have devoted some attention to the Oil industry of India, must have fully realised its importance and the unlimited scope which exists at present almost in all Provinces for its expansion. In spite of these considerations the fact remains that this industry with the exception of one or two mills is almost under a blight and the few attempts that are now and then made, have proved abortive. This is also the opinion of Mr. Kapilram K. Vakil, who has in his paper tried to trace the "causes of the general failure of this industry in the Bombay Presidency." (*vide P. 83*) Mr. Vakil was specially deputed by some merchants of Bombay to investigate the subject and his report will be found useful by those who are interested in this business. Mr. Vakil possesses expert knowledge of the Oil-pressing industry and his views naturally deserve close attention and careful study.

The causes which in his opinion have contributed to the failure of several Oil pressing Mills, at important centres like Bombay and Baroda, Surat, Poona and also in mofussil places, may be summarised thus :—

- (1) Want of special knowledge or experience in the early promoters, who framed schemes with the aid of machinery agents, who were quite ignorant of the chemical and economic side of the business.
- (2) Uneven distribution of capital, *i. e.* investing too much in machinery and too little in building, and leaving no margin for the employment of chemical experts and for other working capital.
- (3) In seven cases out of ten, as a consequence of this unequal distribution and ignorance the mills had to be mortgaged from the very beginning.

- (4) Short sighted policy, in some cases, of the mill owners, the faulty economic basis on which some of the mills were managed and the regrettable want of honesty.
- (5) Wrong machinery with which some of the factories were equipped, *e. g.* machinery suited for castor seed was used for crushing Cotton Seed and so on.
- (6) Ignorance regarding proper principles and methods of treating and refining different kinds of Oil.
- (7) Defective arrangements for the storage of Cake, which soon gets spoiled, if not properly preserved.
- (8) Want of integrity in the agents of the foreign companies who purchase the cake.
- (9) High railway freight on oil and oil cake which make it non-paying when sent to Bombay which is the chief market.
- (10) Shortage of seed supply at some seasons of the year, when they had to be brought all the way from Bombay and reconsigned.
- (11) High prices of casks, loss by leakage in transit, gross adulterations practised by early shippers of oil to foreign countries.
- (12) Refusal of Indian farmers and cattle owners to use machine made cake.
- (13) Growing demand for mineral oils for lighting purposes, has also contributed to the decay of this industry.

Professor Russel of the Patna College contributes a very able and informing paper on the "Study of Economics in India" (P. 145). The main object is to prove that the charge that is generally levelled at the people of India, that they had never in the course of their history evinced an aptitude for the study of any other subject but metaphysics and abstract philosophy is utterly at variance with the facts disclosed by a close acquaintance with ancient Sanskrit literature which "best reflects the culture and civilization of ancient India." "It was",

says Mr. Russel "in the ancient city of Pataliputra (present Patna) that the study of Economics was recognised more than 20 centuries ago as one of the indispensable branches of a liberal education." According to Artha Shastra of Chanakya, the science known as Varta of which Agriculture, Cattle breeding and trade were the main divisions, took rank as one of the four principal sciences and students invested with the sacred thread were directed to study it under Government Superintendents who were specialists in Economics." In the opinion of Prof. Russel the growth of interest in economical problems, which is visible in India today, is not to be regarded as wholly a new or unheard of phenomenon alien to natural tendencies of the Indian people. The author, however, points out that within the last hundred years the subject of study and the scientific standpoint of its treatment have both been radically transformed. There are peculiar difficulties in the application of current theories on Economics to Indian conditions owing to the complexity of facts and the inclination of the human mind to bias as well as prepossessions. He then proceeds to explain lucidly the methods suitable to India that should be adopted for the study of this science.

Along with the above paper, should be read the account of the Patna College Chanakya Society (P. 173) written by its members for the benefit of the Industrial Conference. This Society which was formed in 1909 is working under the auspices of Professor Russel for the study of the works of Chanakya the great statesman, economist, political philosopher of ancient India, whose field of activity was Patna. The immediate object of this Society is to provide for its members an open field for original research and investigation and also to collect as much detailed, connected and trustworthy first hand account as possible of the Economic and social conditions of the people and villages around them in the hope that in course of time their investigations may be useful to the future economists of our country.

"The Importance of Manual Instruction" is recognised today in all the principal countries of the world and the need of its introduction (P. 91) in Indian schools is ably advocated

by Mr. H. G. Bhabha, retired Inspector General of Education in Mysore State. After entering into the technicalities of the functions of the brain and the structure of the muscles, he shows that the activity of the brain-cells depends on the exercise of the muscles and the complexity of their Co-ordination. It is from the age of about 4 to the age of 14 to 16 that the brain centres connected with the small muscles and the joints of the hand and fingers are developed. He thus puts forth the plea for manual instruction not only in Elementary Schools but also in High Schools. The muscular activities which the hands are likely to get at this period of life is not possible at a later age.

Drawing, clay modelling, brush work, stick laying, beadwork, brick building, paper cutting and folding, school gardening, cardboardwork are some of the activities suitable for boys and girls. This should be followed later on by metal work, such as lathework, filing, drilling, chipping, soldering and students of a Manual Training High School of America, in token of completion of their course leave behind as a rule a complete machine built by themselves as a proof of their skill. This is the kind of education given in foreign countries to strengthen, improve and elevate the character of the masses.

Dr. R. V. Khedkar, State Surgeon, Kolhapur puts forth a plea for the "Preservation of National Art, handicrafts and character." (*p. 214*) Dr. Khedkar deplors that the old Indian Art is dying out and the people are imitating modern mores of life and tastes—conditions which are unfavorable to the development indigenous art. The repeated studies of labourers in Europe and America prove the fact that Iron machinery although it may turn out huge quantities for sale does not satisfy the wants of the poorer classes. To remedy this state of things, Dr. Khedkar invites the attention of his countrymen to the silent but useful work which is being carried on by Madam A. L. Pogosky, a Russian Lady who has proved that if the faculty of intelligence, reason, and intuition of the labourers has to be cultivated, it can be done only through the handicrafts instead of depending on machinery. This lady is an advocate of cottage

industries as opposed to the establishment of big factories with the aid of costly machinery. Development of spiritual character is also needed for improvement of national integrity.

We now pass on to the paper of Professor Radha Kamal Mookerjee of the Krisnath College, Berhampore on "The place of the domestic (p. 99) industry in Indian economic life." Prof. Mukerjee treats first of the economic transformation of the Indian village and the gradual extinction of the cottage industries and the rural exodus to cities and other centres of industries conducted on modern lines. In his opinion the self-sufficiency of the village yet remains and the village is yet the real economic unit of India. "Of India" says he "more than of any other country, it can be said that the nation lives in the cottage." There are only 2,150 Towns in the whole country whose population exceeds 5,000 persons and the rest are all villages. The writer next asks the question as to whether it is desirable for India to adopt wholesale the method of Western industrialism and says in reply that the Western methods are not suitable to our environments and socio-economic condition, quoting Dr. Coomaraswamy and a few other writers to support his contention. We may be pardoned for quoting the extracts here for the benefit of our readers :—

"The true end of material civilisation is not production but use, not labour but leisure,—not to destroy but to make possible culture. A nation which sees its goal rather in the production of *things* than in the lives of *men* must in the end deservedly perish." 1 "Already all over the Western world the problem which with ever increasing urgency demands a solution, if peace and progress are to be preserved is that of the persistence of undeserved poverty in the midst of abundant wealth, of unemployment in the midst of unsatisfied desires." 2 Again, "Never before in our history was the misery of the very poor more intense, or the conditions of their daily life more hopeless and degraded; the vast wealth which modern progress has created, has run into pockets of individuals and classes have grown rich beyond the reach of avarice, but the great majority of the toilers and spinners have derived no proportionate advantage from the prosperity which they have helped to create." 3

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1. Dr. A. K. Coomaraswamy's essays in National Idealism, p. 155.
 2. Max Hirsch : Democracy *vs.* Socialism, Introduction.
 3. Mr. Joseph Chamberlain.

The modern highly organised industrialism has resulted in an enormous disparity of wealth, which is at the root of the present wide and manifold social evils, as the real wellbeing of the masses is sacrificed in the interest of concentrated production. To counteract these evil effects, Mr. Mookerjee, proposes the expansion of small cottage industries as much as possible, with the aid of cheap mechanical or electrical contrivances to render the task of the artisan easier without impairing his individuality, his inventiveness or dexterity.

Rao Sahab Ganesh Nagesh Sahasrabuddhe of Ellichpur has arrived almost at identical conclusions and advocates the "importance of small industries and indicates the scope for their development in India." (vide p. 337) Mr. Sahasrabuddh regrets the decadence of the ancient Indian industries in course of keen and unequal foreign competition. In regard to present day industrial activity in the country with the aid of the factory system and joint stock concerns the views of the author may be thus quoted in his own words :—

' The conditions of Foreign countries and those of India are quite different in various respects. The people of England and other countries have been striving for the industrial development of their countries for the last 100 years. They have made great self-sacrifices and have now attained a position of great eminence in the industrial world, owing to the various facilities afforded to them, and the sound and practical education imparted in their Technical Schools and Colleges, Laboratories, Schools of Technology and other necessary institutions. They have become experts in every branch of industry and are systematic and honest workers on business lines. They have thus become armed with the most modern and scientific processes of manufacture, can command enormous capital to finance their concerns, and are fortified with high protective tariffs and are ever ready and able to take the least advantage that may offer itself. But the state of India is quite different. It is full of ignorance, conservatism and poverty. The country lacks skill, technical knowledge of the intricate processes of manufacture. Capital is abundant but shy. There is a lack of enterprise and business ability, and also of honest managers and systematic and earnest workers possessing self-reliance actuated by notions of self-sacrifice. Under these unfavourable circumstances, is it possible for India to work out industrial concerns with profit, and compete with the great competitors of the world abroad? Admittedly, the situation is very gloomy and one is tempted, through sheer despair to give up every thing for lost.'

The Annual Reports published by Provincial Governments on the working of Joint Stock Companies in India, disclose a

very dismal state of affairs and reveal the disadvantages of starting big undertakings, the failure of which brings in train the ruin of many capitalists and poor shareholders, the writer, therefore puts forward the plea in favor of small industries and quotes four or five authorities in support of his contention. The advocates of small industries argue that even in Western countries like England there is "now a reaction against city life so full of hurry and bustle, smoke and squalor and "back to land" is the present cry. Mr. Sahasrabudde defines small industries as those conducted with the help of steam or electricity employing less than 20 operatives each, and also such as are carried on by the hand, foot and animal power. He first takes the cotton industry and shows with the help of statistics the vast scope that still exists for the expansion of handloom weaving even in the face of the powerloom. The writer has proved that in the non-textile industries also there is limitless scope for those who will seriously devote their attention to the subject. In England itself which is justly looked upon by our countrymen as the model of industrial activity there are : —

No.

Textile factories each employing 97 operatives on an average.	} 11,000
Non-textile factories employing 35 workers.	} 79,000
Small workshops do. 8 men.	] 89,000

The above figures speak for themselves, and are sufficient to dispel the popular illusion that there is no scope in these days for small capitalists.

The author proceeds next to give a list of nearly 44 industries which are successfully worked in England on a small scale to the mutual benefit of both the employer and the employes. The tenement factories in Sheffield deserve a special study and may be described thus :—

The "Tenement Factory" is habitual. A small foundry in the middle of the yard, the four sides of which are occupied by hundreds of small workshops, supplied with motive power from a central steam engine and these workshops are rented and sub-rented by the small masters. In Sheffield there

are now about 170 such tenement factories. In some, there are as many as 70 to 80 separate rooms or grinding halls; in others many less. There are approximately 2,900 occupiers who are first tenants, many of these sub-letting part of the rooms. In such tenement factories, you see rows of small rooms, two yards square in each of which one man, standing between his fire and his anvil, makes knife-blades, further on you find rows of workshops of the capacity of a good sized parlour; in each of which a master works with his few aids, making all possible, continually varying sorts of tools; and on the ground floor you discover equally small damp rooms, in which saws and files are fabricated; or slightly larger rooms, in which tools are polished and ground. About 15,000 men are employed in these tenement factories, making these tools and knives, which make Sheffield one of the most widely known towns in the world. (p. 360.)

The thousand and one things of daily use are prepared in these busy agglomerations of small industries and the aggregate value of the products of these small concerns is nearly equal to the aggregate value of the products of large factories. Technical or specialised education, agricultural, industrial or commercial is necessary for the successful conduct of these industries.

The author gives a supplementary list of nearly 138 different suitable industries for men and 11 industries exclusively for women together with a list of the total number of Periodicals in foreign countries each devoted to some particular trade or industry. The total number of such Journals according to his estimate comes to about 2,400.

It is within the recollection of our readers that Lt. col. Atkinson and Mr. Tom S. Dawson were entrusted by the Government to institute an inquiry into the following questions :—

- (1) What openings exist, for the employment of technically trained Indians and what further openings are likely to be available ?
- (2) What types of men and standard of Education and training do employers of labour demand in the various industries ?
- (3) Have these demands been met by the existing technical institutions ?

- (4) If not, how should these institutions be altered or added to in order that they should be in a position to meet these demands ?
- (5) What arrangements can be made for the systematic co-ordination between institutes and employers of labour, in order that they may work in with each other for their mutual benefit and for the good of the country ?

The Report submitted by the above named officer about the "prospects for technically trained Indians" forms the subject of the paper of Professor V. G. Kale of Poona. (p. 403). The objects of the inquiry are indeed not unimportant. If technical education as at present imparted at principal Technical Schools and other institutes in India is carried on in a haphazard manner without studying the actual needs of the employers, waste of energy and time and consequent disappointment will be the inevitable result. "If the existing state of things continues, we may" says Mr. Kale, "have the double evil employers clamouring for the right sort of men" and "technically trained men failing to find employment." As these two officers were not called upon to take up the larger questions regarding (1) organisation of new industries, (2) the revival of old ones, or (3) of the turning out of men of enterprise and business aptitude, (4) the framing of any schemes of large and small technological institutes throughout the country to prepare people for higher professional careers, the scope of their inquiry was thus limited. The recommendations of the committee within the sphere assigned to them though adequate for purpose in view do not give any encouragement to those Indians, who agitate for larger and well equipped, technical institutions for more thorough technical training.

With the other papers on small industries received for the Bankipore Conference may be read the paper of Mr. Trimbak Ramchandra Kotwal Subordinate Judge of Poona, who puts forth a "Plea for cottage industries" (p. 218) while describing his impressions about the industrial exhibition and sale of the work of the Salvation Army in Bombay. The principal

objects of interest were the Exhibits of the silk and weaving industries. All the different processes connected with silk making in all its stages from the tending of the silk worm, reeling of the silk, to the weaving of the silken fabrics were kept on view. To demonstrate the weaving of cotton fabrics, the looms designed by the Salvation Army were shown while in actual operations. Several other smaller industries at present carried on by the Salvation Army bear ample testimony to the useful and philanthropic work of that body which aids the social regeneration of the lower strata of the Society, *viz.* the depressed classes. Many of the industries deserve to be taken up in right earnest by the middle classes also.

Lala Panna Lall, Proprietor of the Upper India Glass Works, Amballa, gives very useful and practical information in his paper on "How to develop Glass making as a cottage industry, (p. 231) Mr. Panna Lall describes the process of constructing the smelting furnaces, crucibles required for these factories together with the kind of labour, ingredients, refining and colouring materials and plants and implements, moulds &c. The paper should be carefully studied by those already engaged in that industry and also by those who are thinking of starting a Glass Factory.

The Resolutions passed at this Session of the Conference will be found detailed in the body of the Report, and need not be repeated here to swell unnecessarily the volume of the book.

Summary of Proposals and Suggestions.

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A.—The work of the Conference.

1. The Industrial Conference should have an annual allotment of Rs. 25,000 in place of Rs. 5,000 and should employ more numerous staff, one to every department of Agriculture, Commerce, Industries, Mining, Co-operation and the like; and these men should travel to organise, educate and if necessary, to agitate. (*Presidential address of Lala Harkishenlal*, p. xiii.)
2. Want of capital and employment of inexperienced staff, will also account for several cases of failure and I think a careful enquiry should be made into the causes not by the people in a haphazard way, but by an experienced man sent out by the Industrial Conference. (*Ibid*, p. xxii.)

B.—Agriculture.

3. We want leaders, that is people who will equip themselves with modern knowledge and up-to-date methods and put them into practical use, with a view of enriching themselves and bettering the lot of their fellow countrymen. Special colleges may do a great deal in this respect, but agricultural chairs in connection with Indian Universities may do a great deal more, they will attract the attention of the highest few, to the subject of Agricultural Economy, and may make them return to land to become master-cultivators. (*Presidential address of Lala Harkishenlal*, p. xix.)
4. We want a spirit of emulation. This can best be secured by organising annual fairs of agricultural produce, village art and industry, cattle shows and physical feats. They should be introduced at all Tehsil headquarters, and worked not by official agency but by a mixed agency, say, Tehsil Boards. (*Ibid*, p. xix.)

5. We want co-operation in cultivation, harvesting, and marketing, as well as in credit. This should be attempted by starting Agriculturists' Associations, the educated agriculturists taking the lead, and the units of such Associations should not be larger than a Tehsil. (*Ibid*, p. xix.)
6. We must go a step forward in marketing agricultural produce, one degree removed from the shape in which it leaves the fields. By this I mean to say that flour and not wheat, oil and not oil-seeds, ginned cotton and not raw cotton, dried fruits and vegetables, where they can be dried, ought to leave the village. (*Ibid*, p. xix.)
7. We want transport facilities for grass, vegetables, fruit, ghee and cattle to near markets. (*Ibid*, p. xx)
8. For the proper working of an agricultural association three things are essential (1) right sort of men, (2) funds, (3) desire to work. (*Mr. V. K. Kogekar*, p. 213.)

C.—Education.

9. For one generation at least the ambition of our educated young men should be to adopt a business career, in preference to an official, educational or professional and that parents should endeavour to give them an outfit qualifying them for this career and that the marriages of the young men, to be dedicated to business, should be postponed even beyond the Vedic limit of 25 years. (*Presidential address of Lala Harkishenlal*, p. xi.)
10. The Government, aristocrats, chiefs and the people should at once and without loss of time, provide the country with business and commercial Colleges, where a knowledge of business machinery, organisation, and efficiency and a knowledge of modern languages should be imparted. (*Ibid*, p. xi.)
11. Chairs of Indian Economics and Agriculture be founded in connection with all the existing and projected Universities. (*Ibid* p. xii.)

12. Economic Science should be studied by all our public men; and by the rising youths of the country with special reference to Indian problems. (*Ibid.*)
13. Boards for Technical education should be inaugurated, and they should endeavour to grapple, with the assistance of public and subscribed funds, to raise the standard of efficiency of labour and to secure greater economy in all handicrafts, and factory industries. (*Ibid*, p. xiii.)
14. Assistant Directors of public Technical or Handicraft education, should be appointed in each province, with a similar system of State schools and Aided schools and Private schools open to Departmental inspection. Bodies like University Senates are required for looking after the Higher Technical Education of each Province or to start with each Presidency. The proposed new universities should be teaching institutions from the very start. (*Ibid*, p. xiv).

D.—Labour Supply.

15. Capitalists should employ proper agencies for recruitment of labour in their prospectuses. (*Presidential address of Lala Harkishenlal* p. ii.)

E.—Cotton Industry.

16. The cultivation of finer stapled cotton, or the invention of machinery to produce finer yarn from present varieties of cotton, should receive our earnest attention; and also everything possible should be done to improve the cotton staple. (*Presidential address of Lala Harkishenlal*, p. xxviii.)
17. I would suggest the formation of an Association with headquarters at Delhi, the membership of which should be open to all the Mills in Northern India; and I would further suggest the formation of one or more associations of the people interested in growing, in buying and in selling cotton. I would also suggest the formation of one or more Institutes of Mechanical Engineers, and carding and spinning masters, with

associations which should try to improve the industry from the special points of view. I may also venture to hope that one or more banks will be specially organised or one or more of the existing ones will specialise in financing cotton trade, cotton industry, export of cotton and import of cotton goods. (*Ibid.* p. xxxi.)

F.—Silk Industry.

The following suggestions have been made by Mr. M. N. De (*vide*, p. 143.)

18. Distribution of disease-free eggs to the rearers ; only licensed rearers should be allowed to sell eggs after microscopical examination. The Government must have examination offices in all the big centres of rearing where the Government officers should examine eggs free of charge or they may go from house to house examining the eggs.
19. Encouraging the rearers to rear one-brooded race in October and February, and Mysore or some well-established manybrooded hybrid races in other seasons. In order to induce the rearers, the eggs must be distributed free first.
20. In a new locality where there is no sericulture, castor silk worm eggs should be first introduced, as this race is more hardy.
21. The appointment of circuit lecturers who have expert knowledge of sericulture for advising the people.
22. The holding of competitive sericultural exhibitions in important centres.
23. The sanction of subsidies for sericultural classes in village-schools, mulberry trees, cocoons, reeled thread, etc.
24. Free distribution of pamphlets in the vernacular of the district for the guidance of rearers.
25. The starting of Silk Associations whose object should be:—

(*a*) to safeguard the interests of silk manufacturers, (*b*) to reply to queries regarding silk industry in general, (*c*) to send members to various exhibitions, (*d*) to bring together spinners, weavers and traders. (*e*) to collect and disseminate useful information and statistics regarding silk, (*f*) to promote technical and commercial knowledge by starting schools for rearing, weaving and dyeing in important silk centres like Bhagalpore, Berhampore, Benares, Ahmedabad, Malda, Gurudaspur, Nagpur, Madras, Bangalore, etc., (*g*) to induce the manufacturers and retail traders to demonstrate to the people, who are carried away by gaudy colours that Indian silk goods have got their own good points specially from the point of view of price and durability, (*h*) to secure just and equitable relations between the silk merchants and the rearers, (*i*) to expand the growth of industrial art, (*j*) to establish Libraries and museums on sericulture in silk centres, (*k*) to induce Government to take up sericulture in Khas Mahals and in Court of Wards estates thus setting examples to others, (*l*) to impress on manufacturers the advantages of Indian as compared with other silks and to be particular about the quality of the silk exported until a silk conditioning house is established in Calcutta or Bombay by the Government, which would stop the exportation of bad silk, (*m*) to establish co-operative societies and guilds among silkgrowers and manufacturers.

26. The establishment of a central sericultural institute with branches in all the important places of silk rearing.

G.—Sugar Industry.

27. The canes from which the cuttings are obtained should be
(1) juicy (containing as little begass as possible), (2)

sufficiently thick, (3) joints at a long distance; i. e., the length between the joints be as great as possible or should consist of as few joints as possible, (4) sweet, (5) drought resisting, (6) healthy never affected throughout the season by any disease, fungi or frost etc. (7) of healthy complete eyes, (8) of very thin joints, (9) long, (10) full of juice inside, (11) of a very thin bark, (12) should not crack on the joints and split up in twain. (*Babu Mukhtarsing*, p. 254).

H.—Capital and Co-operative movement.

28. We must save, invest and organise before we could have a capital Fund to back our industries. (*Presidential address of Lala Harkishenlal*, p. xxxv.)
29. The best way to attract foreign capital would be to introduce large and well-considered schemes with mixed boards. But schemes which are State-aided or aided by Native States or local bodies will have a better chance. (*Ibid*, p. xxxvi.)
30. We should establish a sound and solid banking system in the land. With the number of Banks already started, I would propose the formation of a Banking Association, without any loss of time ; and would urge thereby the discussion from time to time of questions vital to the existence, continuance, permanence and prosperity of the Banks. (*Ibid.*)
31. A very useful system of Banks could be devised by the help of Native States somewhat on the lines of Presidency Banks and Discount Banks combined. (*Ibid*, p. xxxix.)
32. Railways should attract Indian Capital when their earnings amount to 6 per cent, and over. (*Ibid.*)

I.—Life assurance.

33. I would draw the attention of my countrymen to this branch of financing institutions, and would like them at once to combine into an Association, to develop Insurance

on healthy lines, covering all departments of risks.
(*Presidential address of Lala Harkishenlal*, p. xxxix.)

J.—Miscellaneous.

34. The country should be studded with Chambers of Commerce, walking in the footsteps of similar institutions now existing in European countries; whose function should be to find a business career for honest, capable, and willing educated Indian youths. (*Presidential address of Lala Harkishenlal*, p. xii.)
35. Special associations, such as of cotton spinners and weavers, cotton dealers, of Bankers and of Insurance Companies be started at central places, to look into the interests of their special concerns. (*Ibid*, p. xii.)
36. Government should throw open to Indians half the top appointments, in all its Technical departments, namely Railways, Telegraph and Post Offices, Forests, Surveys, Geological and Meteorological Departments, Irrigation, Electrical and Mechanical Workshops, Electric Supplies, and Civil Engineering. (*Ibid*, p. xii.)
37. Special and sufficient provision be made in all Local Councils and in the Imperial to have Commercial and Industrial representation. (*Ibid*, p. xii.)
38. The commercial departments of the Government of India should see to the needs of Indians as well to those of Europeans; and that they should back Indian efforts as often as of outsiders. (*Ibid*, p. xii.)
39. Native States should help the movement of economic regeneration, as they represent $\frac{1}{2}$ th of the whole of India; and means should be found to have their co-operation with the Government, and the people of British India, instead of their making isolated efforts. (*Ibid*, p. xii.)
40. European Manufacturers, Bankers, Insurers, Exporters, Importers and Transporters should advance Indians beyond the position of clerks, and entrust them with

duties requiring intelligence, responsibility and capacity*
(*Ibid*, p. xiii.)

41. Swadeshism should be taken at its word and be organised principally in the channel of capital. (*Ibid*, p. xiii.)
42. Public press should give more attention and space to economic questions rather than to general news, political discussions, racial bickerings and individual panegyrics. (*Ibid*, p. xiii.)
43. The Government, the native rulers, the public bodies, and the patriotically inclined gentlemen could do a lot of good by publishing in advance well-considered information on any new scheme put forward, and if the commercial department of the Government of India leave off its traditional shyness, and advise and seek advice and communicate the same to the new venturers it might do a real yeoman's service. (*Presidential address of Lala Harhishenlal*, p. xxxvii.)
44. The Government should produce stuffs so largely used by its departments by means of *pioneer* industries, which may after a while be transferred to the people on payment of a portion of the money in hard cash and the balance by way of deferred-payment debentures. (*Ibid*, p. x.)
45. Well-known methods of marketing of goods such as holding of Exhibitions and Fairs, and of advertising are badly needed to help the enterprising and the struggling manufacturer. (*Ibid*, p. ii.)
46. If Government will make Railways a National monopoly, great things may come out of it in India. Let Indians be gradually, posted to high places of its administration and Indian ideas and suggestions be invited to make it a National concern. It is the largest Industry no doubt but the people have paid the smallest attention to it so far. (*Ibid*, p. ix.)

RESOLUTIONS

PASSED AT THE

Eighth Indian Industrial Conference

HELD AT BANKIPORE

On Monday, the 30th December 1912.

RESOLUTION I.

The Delhi Outrage.

The Indian Industrial Conference expresses its indignation and abhorrence at the dastardly outrage committed upon the life of His Excellency the Viceroy and begs to offer its respectful sympathies to Their Excellencies Lord and Lady Hardinge and the Conference fervently prays that His Excellency will have a speedy recovery and restoration to health.

Moved from the Chair.

RESOLUTION II.

Agriculture and Commerce.

In view of the great importance of properly developing agriculture and Indian Commerce, this Conference urges upon Government and the people the urgent necessity of establishing Chairs of Agriculture and Commerce for spreading knowledge of the general principles of these subjects among persons who do not wish to specialise in them; and for the suitable advancement of Technical Education, the Conference strongly advocates the creation of Boards constituted on lines similar to the Senates of Universities for directing and regulating instruction therein.

Proposer—Hon'ble Rao Bahadur R. N. Mudholkar.

Seconder—Hon'ble Babu Krishna Sahay.

RESOLUTION III.

Indian Chambers of Commerce.

This Conference draws the attention of the commercial and other business classes

- (a) to the great necessity of establishing Indian Chambers of Commerce and Associations of the Industrial and Financial interests, wherever favourable circumstances exist and
- (b) to the importance to themselves and to the country of their engaging to a greater extent than hitherto, in the foreign trade of the country.

Proposer—Mr. L. V. Kaikini.

Seconder—Dr. S. V. Ketkar.

RESOLUTION IV.

The Atkinson—Dawson Inquiry.

This Conference expresses its disappointment at the recommendations made by Lieutenant-Colonel Atkinson and Mr. Dawson in regard to higher Technical Education and expresses its disagreement with the recommendation in regard to the State Technical Scholarships, as these recommendations are not calculated to secure that higher type of knowledge of principles and practice which is required for organisation, direction and management of industries.

Proposer—Mr. N. A. David.

Seconder—Mr. M. B. Sant.

RESOLUTION V.

Polytechnic College.

While expressing its appreciation and thankfulness to the Government for the liberal action taken and contemplated, in regard to Technical education, this Conference once more records its firm conviction that for placing the cause of industrial progress on a firm basis, it is most necessary that the Government should

establish in the country at least one fully-equipped Polytechnic College for imparting the highest kind of instruction in the applied sciences and industrial arts.

Proposer—Honourable Babu Dwarkanath.

Seconder—Mr. Mithila Saran Sinha.

RESOLUTION VI.

Technical Education.

This Conference urges all Provincial Governments and administrations, Rulers of Indian States, as well as Principals and Superintendents of Private or Aided Schools and Colleges, to add Commercial, Technical and Industrial classes for instruction in commercial subjects as well as in weaving, dyeing, sheet-metal working, smithy, carpentry etc., to the existing courses of instruction, wherever practicable.

Proposer—Mr. Moulvi Mahamad Hussain.

Seconder—Mr. Chandrabhan Sahay.

Supporter—Mr. G. N. Kane.

,, Mr. G. K. Harkare.

RESOLUTION VII.

Failure of Industrial Enterprises.

This Conference notes with regret and concern the failure of several industrial enterprises started for carrying on new industries and the effect these failures have produced in damping the ardour of the people in the development of the resources of the country. The Conference calls upon the leaders of the people in the different Provinces and Districts to institute inquiries into the causes of these failures and to communicate to the General Secretary the results of their inquiries, and authorises the General Secretary to depute one or more persons for conducting this investigation, if the funds at his disposal permit.

Proposer—Professor Jadunath Sarcar.

Seconder—Rai Narayan Prasad Sahib.

Supporter—Mr. K. P. Sen Sinha.

” Rao Saheb Ganesh Nagesh.

RESOLUTION VIII.

Hand-loom Weaving.

This Conference specially invites the attention of the capitalists to the great and urgent necessity of improving the existing condition of the weaving industry by the introduction of labour-saving hand-loom and other devices of approved patterns, in important centres of the Hand-loom weaving industry, with the co-operation of the weaving classes.

Moved from the Chair.

RESOLUTION IX.

Railway Rates.

This Conference once more calls the attention of the Government to the prevailing complaints about the anomalous character of the existing Railway rates on goods and their prejudicial effect on interprovincial trade ; and urges the necessity of laying down, for interprovincial consignments, the same scales of rates as those for consignments to and from important ports.

Moved from the Chair.

RESOLUTION X.

Faculty of Commerce.

This Conference records its sense of gratitude to the Government of Bombay for having created a Faculty of Commerce and urges the other local Governments and Universities in India to follow the example of the Bombay University in establishing Faculties of Commerce for giving an impetus to Commercial Education.

Moved from the Chair.

RESOLUTION XI.

Provincial Departments of Industry.

This Conference once more urges that :

- (a) There should be in every province of British India, a Department of Industry under a Director of Industries to deal with purely industrial questions and to be in charge of Technical, Commercial as well as Industrial Education in the Province; and that there should be an advisory board of qualified persons, not less than one half of whom should be non-official Indians, who should be consulted on economic questions of importance ; that the functions of this department should include (1) the introduction of new or improved methods and processes, (2) the carrying out of investigations and experiments, (3) the development of selected industries, and (4) the organisation of industrial and commercial Exhibitions.
- (b) That there should be an Industrial Museum and bureau of information under the Department of Industry for supply of information and advice to the public on all Industrial and Commercial matters within the province.

Proposer—Honourable Mr. Gokuldas K. Parekh.

Seconder—Babu Ram Gopal Choudhary.

RESOLUTION XII.

Co-operative Banks.

This Conference once more welcomes the establishment in the Bombay Presidency of a Central Co-operative Bank and urges upon the Government and the people of other Provinces, the need of establishing similar Banks to help the existing Co-operative Credit Societies for advancing loans at reasonable rates and on easy terms to the agriculturists.

Proposer—Rai Purnendu Narayan Sinha Bahadur.

Seconder—Mr. L. V. Kaikini.

RESOLUTION XIII.

Miscellaneous.

This Conference confirms the resolutions passed in previous years :—

- (1) Calling upon the Government and the people (a) to encourage and help Indian manufactures and (b) to foster and encourage the use of such manufactures ;
- (2) Recommending to the people the desirability of starting Funds for the promotion of Technical and Industrial Education ;
- (3) Inviting the attention of capitalists in India to the urgent need of developing and fully utilising the mineral resources of the country and asking them to make organised efforts in that direction ;
- (4) Urging upon the attention of the Imperial Government the special claim to consideration of the Textile and Sugar Industries ; and praying for the repeal of the excise duty on Cotton goods ;
- (5) Urging upon Government the desirability of the standardisation and unification of Weights and Measures so as to remove the serious inconveniences caused to trade by their multiplicity.

Proposer—Mr. Mathura Nath Sinha.

Seconder—Mr. S. V. Lalit.

RESOLUTION XIV.

Co-operative Credit Societies.

This Conference expresses its great satisfaction at the progress which Co-operative Credit has made in this country since the passing of the Co-operative Credit Societies' Act of 1904, and earnestly hopes that with the wider application of the principle of Co-operation under the Co-operative Societies' Act of 1912, Government will give larger financial and administrative facilities which are needed to secure a surer growth of Co-operation and

exhorts the educated public to strenuously extend its operations to various branches of agriculture and small industries which are bound to prosper with the help of the Co-operative movement.

Proposer—Mr. G. K. Devadhar.

Secunder—Mr. R. V. Mahajani.

RESOLUTION XV.

Sir T. Palit's Gift.

This Conference places on record its sense of gratitude to Sir T. Palit of Calcutta for his munificent gift to the Calcutta University and expresses the hope that his example would be followed by others.

Moved from the Chair.

RESOLUTION XVI.

Office Bearers.

The Honourable Rao Bahadur R. N. Mudholkar be appointed General Secretary of the Indian Industrial Conference for the next year, Mr. N. A. Dravid, Honorary Assistant Secretary and Mr. M. B. Sant, Assistant Secretary and this Conference appeals to the public for a sum of Rs. 8000 to carry on the work of the Industrial Conference.

This Conference deems it desirable that there should be a Standing Committee appointed for each year to co-operate with the General Secretary in carrying on the work of the Conference during the year and to advise him on all such matters as he may submit to them and that the following gentlemen do constitute the Standing Committee for the year 1913 :—

Sir R. N. Mookerji.

Lala Harkishen Lal.

Mr. J. Chaudhari.

Sir Vithaldas D. Thackersey.

Mr. D. E. Wacha.

Hon'ble Mr. Lalubhai Samaldas.

Dewan Bahadur P. Rajaratnam Mudaliyar,

Dr. Satish Chandra Banerjee.

Mr. C. Y. Chintamani.

Rai Purnendu Narayan Sinha Bahadur.

Hon'ble Mr. M. B. Dadabhoy.

Hon'ble Babu Krishna Sahay.

Hon'ble Rao Bahadur R. N. Mudholkar (*Ex-officio*).

Proposer—Hon'ble Mr. Krishna Sahay.

Seconder—Professor Jogindra Nath Samaddar.

HARKISHEN LAL,

President,

Eighth Indian Industrial Conference.

R. N. MUDHOLKAR,

General Secretary,

Indian Industrial Conference.

PROCEEDINGS

OF THE

Eighth Indian Industrial Conference.

The Eighth Indian Industrial Conference met at the Congress Pandal at Bankipore on Monday the 30th December 1912, at noon.

At the appointed time, Lala Harkishen Lal, B. A., Bar-at-Law, Lahore, the President—Elect accompanied by the Hon'ble Mr. Justice Syed Hassan Imam, the Chairman of the Reception Committee, the Hon'ble Rao Bahadur R. N. Mudholkar, the General Secretary of the Industrial Conference, the Honourable Rai Bahadur Krishna Sahay, Prof. J. N. Samaddar and other distinguished gentlemen, entered the pavilion under an escort of Industrial Conference Volunteers supplied by the Patna College Chanakya Society, and took his seat on the dais amidst loud cheers. The following gentlemen were also noticed among those present :—The Hon'ble Mr. S. Sinha, Mr. C. Y. Chintamani, The Hon'ble Babu Dwarkanath, Professor Jadunath Sarkar, Rai Narain Prasad Saheb, Mr. K. P. Singh, Rao Bahadur Mundle, Rao Saheb Ganesh Nagesh Sahasrabuddhe, Mr. R. P. Sen Sinha, The Hon'ble Mr. Gokuldas K. Parekh, Rai Puraendu Narain Sinha Bahadur, Babu Ram Gopal Choudhary, Messrs. N. A. Dravid, G. K. Devdhar, Pandit Ramakant Malaviya, Babu Sheo Prasad Gupta.

The Proceedings were formally opened by the Hon'ble Mr. Justice Syed Hassan Imam, the Chairman of the Reception Committee, who in welcoming the delegates said :—

Speech of the Chairman of the Reception Committee.

Gentlemen, on behalf of this Province, it is to me a privilege and a pleasure to give you that welcome which it is your right to expect and which it is the wish of the Province to express to you through me. I do not, personally speaking, desire either to anticipate the points that will arise for discussion in this Con-

ference nor do I think it is expected from one who is the mouth piece of the hosts, that have the honour of entertaining you to-day to undertake to forestall the speakers who will deal with the various subjects that will be raised for discussion. I consider that my duty, as the Chairman of the Reception Committee, lies only in expressing on behalf of the people, who have elected me to this position, to you one and all, a welcome full of warmth and cordiality. You are going to have as your President for this 8th Industrial Conference, a gentleman, whose name stands for all, that is in the interests of the Industrial progress of the country I do not require to introduce to you in glowing terms, the name of Mr. Harkishen Lal (cheers) ; for indeed, if there were any occasion for me to introduce him to any one of you, I would be reflecting on you for your ignorance ; for who does not know the honoured name of Mr. Harkishen Lal and connected him with all the Industrial movements of the country ? (Cheers.) You all know for yourselves, because you realise it in the every day affairs of your home what an important part industrial progress plays in the making of a nation. That the pulsations of national life derive their vitality from the peaceful arts of Industry does not require to be dwelt on by me ; you realise it in the daily affairs of your life. I, therefore, invite the President—elect Mr. Harkishen Lal to take the chair, which is his by your choice and by your suffrage. Mr. Harkishen Lal, I request you to take the chair (cheers).

The President Mr. Harkishen Lal after due election delivered the following address :—

Presidential Address.

GENTLEMEN,

In the first instance, I wish to express my sincerest thanks for the very high honour you have conferred upon me in asking me to-day to preside over this Conference. Men, who have occupied much higher positions than myself, have felt themselves honoured in being invited to occupy this chair, so it is needless for me to say that I feel very much beholden to you all, for the great honour that you have bestowed upon me.

Gentlemen, before proceeding further you will all join with me in deprecating with all our power and influence the dastardly

attempt that disfigures the bright horizon of well ordered progress. Of late years a mania for bomb-throwing at English officers and killing people who are supposed to help in the detection of these heinous crimes has taken hold of a few disturbed minds. I wish I knew them all to lay before them the ill-effects of disturbing an ordered state of things that has been established in this country by the genius of the English race. If these maniacs have no human sympathy left in them, they should at any rate realize, in the interest of the country they profess to love, that our future is all tied up with a steady and orderly progress, and it is not possible to make any progress whatsoever if the present Government were to change. They must also realize that the power of the English does not lie in a Lord Hardinge or even a Mr. Gladstone or Lord Roberts but in the race and a few bombs, even if they all prove fatal, will not succeed in exterminating, the race that the All-powerful, All-seeing and All-just has placed over us to guide our destinies, as I believe, to a bright future. I appeal in the name of Mother-India that we have all learnt to sing about, that patriotism requires that our young men should be turned to the best service of the country which consists in helping the present order on to a noble goal. I trust you are all of the same mind as I am in condemning these dastardly acts and are ready and prepared to extend our active sympathies towards the British people who are so helpful to us and to our future elevation. You will also join with me in wishing Godspeed to Lord Hardinge in his noble mission of cementing all races and classes.

2. Gentlemen, the Industrial Conference has already been held, seven times, under distinguished auspices, and under the Presidentships of gentlemen who were experts, and well-informed authorities on the subject of industrial requirements of India, and who have already in their addresses, surveyed the field from Pekin to Peru. The various reports of the Industrial Conference shew, that a large number of suggestions have been already made, by eminent authorities and thinkers, for rejuvenating decaying industries, for introducing new industries, and for advancing and improving existing industries. The conditions, social and political, under which industries flourish and decay, have also been reviewed ; and some very valuable contributions have been made to the history of nations' industrial rise and fall. The

most important industries, such as cotton and sugar, oil and mining have been treated at some length, and elaborate papers have been contributed on several other matters. A comprehensive survey of the economic field has also been attempted, therefore, at first sight, nothing, it would appear has been left for the new comer. He must, it would appear, dish up anew old food with fresh spices. It would, at best be an increasingly difficult position for a new comer, to survey the whole field once again; it is therefore humbly suggested that if special subjects are treated by the Presidents: and specialists only are invited to preside, we may be finding a way out of the difficulty. But as the time-honoured practice has not been officially countermanded, I shall be guilty of introducing an innovation if I attempted any such thing, hence I will confine myself to a general survey of the economic position, which in the nature of things, cannot, in the short space of time allowed for the preparation of such speeches, be made, by any means, exhaustive, deep or complete. I would therefore crave your indulgence for the very cursory survey that I shall present to you, and shall be content if I am able to supply some food for reflection to some of my countrymen.

Economic Position of India.

3. That the economic position of India is at about the lowest rung of the ladder is now universally admitted. A recent visitor from British Isles recorded his impressions in the following terms:—Speaking of the multitude of men, women and children he described them as “a little below the most meagre comfort, and a little above the nearest road to starvation”. “The country” he goes on to say “looks homeless. It leaves an impression of poorness and melancholy. The villages are piteous clusters of mud walls, daubed round the sides of a thickpond in the bare earth.” Another writer says that “they describe a state of society which to English eyes is almost inconceivably simple and elementary, destitute of comforts and conveniences that we are accustomed to regard as essential to civilised life.” After fairly considering the two sides of the controversy the same writer proceeds to say:—“Let us look somewhat more closely into the facts. The total population of India, including that of the protected Native States, is three hundred and fifteen millions;

three-fourths of this vast population is supported by agriculture ; the area under cultivation is not accurately known, as the returns from the Native States are incomplete. But we shall not be far wrong if we assume that there is less than one acre of cultivated land per head of total population, and not more than one acre and a quarter per head for that portion of the population which is directly supported by agriculture. Subtracting the land utilised for supplying foreign markets from the total area under cultivation, we shall find that what is left does not represent more than two-thirds of an acre per head of the total Indian population. India, therefore, feeds and to some extent clothes its population from what two-thirds of an acre per head can produce ; there is probably no country in the world where the land is required to do so much." Further on he says : " It may also be inferred that the average income of the peasant cultivator is very small. The net profit obtainable from an acre of land seems to us altogether inadequate for one person's support ; and our conclusion would be the same if we take a family of five, namely, two adults and three children, and a holding of five acres as the unit. But according to Indian ideas and a traditional standard of very thrifty and frugal living, five acres of good irrigated land will support such a family comfortably. But all the land in India is not good, and every peasant's holding is not a five acre plot. Some peasants hold considerably more than five acres, consequently others hold less. And when we get down to the man who holds less than five acres of land and that of poor quality, then there is a want and a hard struggle for existence. That man and his household are poor even in the Indian sense of the term." " Below the peasant class there is a large class of landless folk, who also find support from the land by working for the well-to-do cultivators in return for a wage." " There are also other residents of the village who do not actually cultivate land, but yet are indirectly supported from it ; such are the village blacksmith and the carpenter who make ploughs and other agricultural implements, the barber, the cobbler or leather worker, the washerman and the waterman, all these receive doles of fixed amounts from the grain heaps at harvest time, and other dues and perquisites." " No one," the writer continues to say, " would pretend that this Indian village life is ideal, or unaccompanied by much that is distressing to the human mind to contemplate."

4. Such in broad outline is the structure of rural life throughout India. It is the life led by nine-tenths of the population, only the remaining tenth live in towns with over five thousand inhabitants. We hear of the great cities of India, but they can almost be counted on the fingers of one's hands. There are not ten cities and towns in India with a population exceeding two hundred thousand. Of these four are maritime towns; whose creation is largely due to British Capital and Commerce; four (Delhi, Lahore, Lucknow, Ahmedabad) are the capitals of former dynasties, while one (Benares) is the holy city of Hindustan. Contrast this with England where ninety per cent of the population live in towns, containing ten thousand inhabitants and upwards, and twenty-five per cent live in towns with over two hundred and fifty thousand inhabitants.

5. Of the remaining 10 per cent it is not easy to draw a picture like the one one can draw about the main Indian Industry, namely, agriculture; these ten per cent comprise commerce, administration, defence, household and sanitary services, gentlemen at large, builders carriers, learned and artistic professions and miscellaneous avocations. The condition of these people from the Indian standpoint of view, may not be low; but it is nothing like what it is with similar classes in the advanced countries of Europe or America. We know their likely incomes, from the incometax statistics, and we also know from actual observation that there is not much to be proud of.

6. (a) There are certain figures, collected from general publications, which are worth reproducing to realise the correct situation. The number of persons assessed for income-tax in the year 1909-10 was only 275,623, inspite of the great vigour, now being shown in this respect under the name of "improved administration". In connection with this revenue the Government Blue Book remarks that a large proportion of the revenue is collected in Calcutta and Bombay.

(b) Post Office Savings Banks which have been in operation near about a quarter of a century show a total of deposits amounting to £11,279,215 at the end of year 1910-11 comprising 1,430,451 accounts consisting of—

1. Professional	...	...	...	...	459,771
2. Domestic	...	...	...	...	241,104
3. Commercial	...	...	...	...	59,735
4. Agricultural	...	...	...	...	32,395
5. Industrial	...	...	...	...	54,061
6. Others	...	...	...	...	583,385

these figures represent the working of 8,929 Post Offices.

(c) The Banking deposits of the whole country amounted to less than eleven crores inspite of the fact that special efforts have been put forth in this direction during the last 5 years.

(d) The total number of factories worked by mechanical (including electric) power, owned by Companies or private persons in British India, and returned as registered under the Act was 2,146 in 1910. The classified list of these factories according to official records is as follows ;—

Description.	No. of Works.	No. of Operatives.
Cotton presses	1,057	99,077
Cotton mills	215	216,883
Jute presses	103	28,327
Jute mills	59	204,053
Rice mills	224	20,368
Flour mills	32	3,111
Sugar factories	21	5,424
Saw mills	96	10,583

Iron and brass foundries	58	24,368
Indigo factories	...	17,337
Tile factories	14	5,293
Printing presses	18	13,971
Dockyards	9	10,392
Railway Workshops, etc.	47	72,000
Petroleum Refineries	6	8,735

(e) The Indian Railways consisting of 33,000 miles of track in 1911 employed 7,699 Europeans, 9,554 Anglo-Indians and 5,22,741 Indians which figures, we may presume, include 72,000 operatives employed in Railway Workshops.

Review of above and General Introduction.

7. From the above it is clear that from the two sources of support, of the vast population of India, namely, Agriculture and Industry, it could not be expected that large savings of Capital would be possible, unless agriculture was made more intense and extensive, and labour was drifted partially from Agricultural to Industrial pursuits. The other sources of income like the Forests, Mining, the Fishery and Commerce should not be neglected, and should receive attention as well as agriculture and manufactures. A mere statement of facts and expression of pious opinions will not effect much. A careful examination of all the factors, that help production, cheapen distribution, avoid waste of commodities and energy (both human and physical) and reduce the drain, is needed. A thorough study of conditions, political, social, religious, educational and moral has to be made so as to effect the economic elevation of the country.

Impossibility of Complete Treatment.

8. Now, gentlemen, to attempt to accomplish all this in the course of an Address, however elaborate, is an impossibility; and I should not like to be guilty of attempting what is not possible; but with your permission, I will venture to offer passing remarks on various questions that arise, in the consideration of the topics

just mentioned, and I shall be pardoned if the treatment of the subjects is but meagre.

Agriculture.

9. Let us take agriculture first. This is the mainstay of India. It is carried on now in very much the same fashion as it has been for ages past. Optimists may describe the situation as follows:—"Not only does the land of India provide food for the great population, for with the exception of some sugar no food is imported from other countries, but a very considerable portion of it is set apart for exports. India supplies the whole world with jute; its cotton crop is the second largest in the world. It sends abroad very large quantities of rice, wheat, and oil seeds. In fact it pays its bill for imports of merchandise and treasure and discharges its other international debts mainly by the sale of agricultural produce." A pessimist, however, observes that:—"We are now in a position to apprehend the significance of famines in India. A country that depends almost entirely on agriculture carries its eggs in one basket. If the crops are bad, its only industry ceases to produce and everybody feels the effect. Indian agriculture depends on the seasonal monsoonic rains, and these rains are sometimes insufficient and occasionally fail altogether."

Water-Supply.

10. This at once raises the question of supply of water for the cultivation of land. We know as a fact that India is blessed with rivers in the north, throughout the whole breadth of the country, and the Central and Southern parts of India are also not without their rivers. There is an underground supply of water, which has been tapped from time immemorial, and recent investigations prove that there are sources of water underground, still lower down, which modern science may be able to tap with means which were denied to our ancestors. The "Monsoonic" supply of water is allowed to run waste in many cases; the rivers pour their waters into the seas unused, and the underground sources are not tapped properly. In some cases, want of means stands in the way and in others the cost of lifting the water is prohibitive. Thus the need of canals, drains, tanks and scientific appliances for boring and lifting water is fully established. The Government of

India has a fixed programme for helping the country with a better water-supply, from rivers and tanks but whether it is a sufficient programme is a question too difficult to be handled properly in this place; but the rulers of the Native States, the landed magnates and the capitalists have not, to any appreciable degree, shown their inclination in this direction. They may be respectfully invited to co-operate with the Government in this matter. This will afford a field for making several undying reputations, and I have no doubt that future generations will bless and cherish the memory of those who will help the country in this respect. While an increase of supply of water is wanted, economy in the use of water is also required. How to effect this is a question for some intelligent and educated agriculturists to decide.

Agricultural Crops.

11. India grows food grains, (rice, wheat, millets, gram, other pulses and grains), oil seeds, sugarcane, cotton, jute and other fibres, (and some fruit and timber which owing to their insignificance are not mentioned in official reports). It is said that the food grains now grown in India, not only supply the food for the people, but leave over a surplus for export. Opinions on this question are not unanimous. It is still uncertain whether the export of food grains represents a real surplus or a corresponding starvation or semi-starvation of a large population. However that may be, the landholder cares to grow only what he can sell, what he can grow easily, and what is required for his own use. He is not patriotic enough to refuse to sell outside India what may be required for his own people in the country, nor is he ambitious enough to cultivate crops which will fetch a better value. Example should, therefore, be set by enterprising agriculturists to raise more valuable crops such as cotton, sugarcane, tobacco, fruits (that can be preserved) and timber that can be used for manufacturing purposes at home and abroad. The food crops should be more evenly distributed, and we should expect a larger consumption of food grains per head of population, if the vitality of the race has to be improved.

Crops.

12. It is not only that more land has to be broken, and brought under the plough, and a larger variety of crops has to be

grown, but better crops have to be raised both in quality and quantity. It is now a common place of knowledge that an acre of land produces larger crops in America, England, France and Germany than it does in India, and that their produce is in every respect of better value. I do not propose to enter into the details of measures to be taken to bring about these results, but I have drawn attention to the fact in order that if greater wealth is required in the country, it must be remembered that the resources of agriculture have not been exhausted; and that there are possibilities still immense for a better supply of the creature requirements and comforts of the vast agricultural population, and that thereby a very much larger surplus can be raised for the common weal.

(a) We want leaders, that is people who will equip themselves with modern knowledge and up-to-date methods and put them into practical use, with a view of enriching themselves and bettering the lot of their fellow countrymen. Special colleges may do a great deal in this respect, but agricultural chairs in connection with Indian Universities may do a great deal more, they will attract the attention of the highest few, to the subject of Agricultural Economy, and may make them to return to land to become master-cultivators.

(b) We want a spirit of emulation. This can best be secured by organising annual fairs of agricultural produce, village art and industry, cattle shows, and physical feats. They should be introduced at all Tehsil headquarters, and worked not by official agency but by a mixed agency, say, Tehsil Boards.

(c) We want co-operation in cultivation, harvesting, and marketing, as well as in credit. This should be attempted by starting Agriculturists Associations; the educated agriculturists taking the lead, and the units of such Association should not be larger than a Tehsil.

(d) We want a step forward in marketing agricultural produce, one degree removed from the shape in which it leaves the fields. By this I mean to say that flour and not wheat, oil and not oil-seeds, ginned cotton and not raw cotton, dried fruits and vegetables, where they can be dried, ought to leave the village instead of the present day-system.

(e) We want transport facilities for grass, vegetables, fruit, ghee and cattle to near markets.

Cattle.

Gentlemen, even an Indian frugal and thrifty as he is, does not live only on food grains, and vegetables ; but requires to swallow his food tinctured with a little *ghee*, and occasionally meat. He requires cattle for these purposes, and also as beasts of burden and as helpmates in the cultivation of land and raising of water. Are we doing all that is possible in the farming of cattle and poultry? I have no hesitation in saying that this branch of agricultural industry, is left entirely to chance and fate. There are large wastes in the mountains, sub-mountains and in the country itself, owned by State, Native States and the people, which could I think be utilised for an increased supply of mutton, meat, wool, ghee, butter and milk, to increase both the vitality and the wealth of the people.

Manures.

13. In the economy of agriculture, you are well aware while a better knowledge of methods of cultivation, and preparation of land and preservation of crop is required, while a more copious supply of water is needed, while a greater care in the use of water-supply is essential, while a greater variety of crop is needed, and while cattle has to be reared as regular concerns, one other factor, the food for the land I mean manures, has also to be considered. All people who have any knowledge of cultivation know the use of manures, and curiously enough, manure, which is the food of the land, comes out mainly from its waste products, and excrecences of animals. In some rough form these have been used as fertilisers from time immemorial, but that they can be made a great deal more efficacious by a little effort is a well-known proposition.

Grasses.

14. While speaking of cattle, animal produce, and manures, one's attention is naturally drawn to a crop not much cared for at present, but which, with a little more attention can be made to yield results out of all proportion to the time taken. I am referring

to grasses, growing naturally or as the results of human labour. It is claimed that owing to transport facilities, afforded by railroads and public roads, and growth of surplus crops in Canal Colonies the famines, or at any rate general famines, have become a thing of the past. We need not stop to argue out the position thus taken, but no attempt has ever been made to prevent fodder famine. Leaving aside the question of human sympathies for animal life, all the world over, and more especially in India, what an amount of wealth and resources of agriculturists is destroyed in time of draughts which cripple the agriculturists for many a year to come. That cattle is a valuable asset in the cultivation of land, and a very important factor in rural economy, no one will question. Means are, therefore, required to be taken to have a plentiful supply of food for cattle available at all times. The food of cattle at present consists of certain grasses, vegetables, stems of food grains, leaves, grams and cakes, unlike Europe where a greater part of food for cattle consists of artificial preparations, mostly consisting of outer shells of grains called refractions or pollards.

If it is desired to improve the lot of agriculturist, the life of cattle should be our care as much as the life of the man himself. It is therefore essential that attention should be paid to the selection and growth of grasses, their preservation and easy transport. It is also necessary that if food has to be exported to Europe, it should be exported in a form which will leave behind that portion of grain which is required for feeding cattle. I mean devices should be invented to export flour and dal rather than wheat and pulses and similarly oil should be exported rather than oil seeds.

15. This brings us to the consideration of the questions of industries arising directly out of agricultural products, but we may defer the subject to its proper place and deal with it when we come to deal with subject of Industries as a means of production of wealth.

16. These few suggestions have been made, as all of us are convinced that India is essentially an agricultural country, and from the consideration of the whole economic position it is clear that the chief sources of wealth being agricultural, and the labour being more immobile, than mobile, and not likely to evince great

and sudden inclination towards urban places, and pursuits, the most ought to be made of the situation as it is ; and efforts should be made chiefly to improve the agriculture of the country in all directions. The Government is doing its share, but others have not shown any movement in this direction. Agricultural departments have been initiated, agricultural colleges have been opened, experimental farms have been started, and some agricultural literature, though in a foreign language, has been made available. And in time, it is hoped these factors are likely to tell, but considering the magnitude of the issues involved. Government alone has neither the resources, nor the opportunities to grapple with the whole question single-handed. People in general, as well as landholders, magnates, and Native States must come in to share in this labour of love. A great deal must be done before we can say that the lot of the agriculturist has been appreciably and permanently improved. I am not vain enough to attempt to lay down a programme for a century or half a century, but I have ventured to suggest here what strikes me as the immediate urgent steps necessary to be taken.

17. I have not said anything here as to settlements, assessments, water-rates and other political-agricultural questions, as they have formed subjects of discussions so often that no useful purpose would be served by repeating the oft repeated arguments.

18. The other sources of national wealth are country's minerals, forests, fisheries and as an adjunct to industries coal, oil and water-power. India is blessed with all these, but they all require development. Some think it is the want of capital that is keeping us back ; others think that it is the want of technical skill that is responsible for slow growth in this direction ; while others are of opinion that it is the policy of the Government that would account for the absence of enthusiasm ; and some are of opinion that it is the policy of the Railways not to help the people in this matter. I, however, think that though all the above may share the blame, the real difficulty is the absence of the business man, equipped with business experience, armed with the power of organisation, and commanding credit and respect of his countrymen. While improved agriculture should be the first concern of our educated aristocrats, mining, forestry, fishery and the like

should be the concern of the business people imbued with modern spirit and modern knowledge of organisation.

19. Already coal mining is finding employment for 1,161,000 people, and in consequence of improved mining methods the output per head has grown from 89 tons in 1904 to 104 tons in 1910, but even this is a low degree of efficiency if tested by European standard. The total output of coal has been $12\frac{1}{2}$ million tons in 1910 valued at about 370 lacs of rupees ; and gold, which comes next, accounts for 330 lacs of rupees ; petroleum, raised chiefly from Burma and Assam, was valued at 126 lacs, manganese at 130 lacs, and salt at about 78 lacs of rupees. These figures have been quoted to illustrate the possibilities of mining in the country and thereby increasing the wealth of the people. There are some ugly features about this mining business, and more especially in the case of gold and petroleum, as the country receives only a small share in the nature of royalty or price ; and the main portion of the profits leaves the country. The policy of the Government and of the States with regard to the granting of licenses to the outsiders can be modified only, when there is sufficient earnestness shown on behalf of the Capitalists to undertake the mining of the country into their own hands. But this is an industry requiring comparatively fewer complications than what we call manufactures, and on the principle that all wise movements should be on the line of least resistance, minining should have earlier attention than the manufactures ; and if wildeat schemes are not only floated but only should schemes after useful and thorough enquiry, as the famous Tatas have done in the case of their Iron and Steel concern, it may be fully presumed that the result will prove more than encouraging, and a source of wealth will be opened up to us, which, in due course, is bound to tell favourably on the manufactures of the country, both mechanical and chemical, and also on artistic and plain arts of life.

20. Next to agriculture and mining, forests and fisheries should receive our attention. Forests of the country give to the present generation a treasure which nature has taken centuries to accumulate. In the case of India unfortunately forest area is by no means so large as in some other countries, but it is decent enough to receive attention. Excepting a small area of about

77,000 square miles, owned by private individuals, the rest of forest area is owned by the State or the Native States ; which own, at a rough calculation, about 240,000 and 54,000 square miles respectively. Several Native States and the Government of India have now a system of working out these forests, and are raising a fair amount of annual net revenue. What we are concerned with here, is the small attention hitherto paid to the industries, arising out of forest produce, like resin, turpentine, wood-pulp and the like. Under existing conditions one could not be very sanguine about these industries arising out of forest produce ; but surely much could be done in this direction, if only the Forest Department took the leading Industrial people of the country into its confidence. There is another aspect of forestry, and that is the cultivation of fresh and more valuable trees, which also should be attended to, to gradually improve the value of the Forests.

21. In some countries, fisheries, both river and sea, find employment to a large number of people, but in India the fish industry is so insignificant that it finds no mention in official reports. Water is the nursery of nature, where nature breeds very profusely and produces a variety of fish, valuable alike for human food, for fertilising the land, and for affording openings for several industries. This is one of those industries, where small capital and small skill and method, reward the people with large results. We should consider this industry seriously as it will help in invigorating the people, if their food of rice and vegetables is supplemented by a fish fare ; and as it is a gift of nature, to be had for the trouble of taking it, it must in the long run tell in favour of the wealth of the people also ; and I recommend that those who live in the neighbourhood of fish supply may organise fish industry and fish cultivation.

Manufactures.

22. Now let us go a step further, and consider for a while the Arts and Industries of the country. The arts and manufactures of India, as at present practised, are separable into two sections : namely those done by hand and those done by steam power. The handicrafts, in spite of the progress of steam power industries, are still the most important, and afford considerable

employment over the whole country. While steam power factories are reported to find employment for 7,39,222 persons, the handicrafts are said to account for several millions distributed into 11 groups in the census of 1901 as follows :—

Order.	Persons supported in thousands.			
Food, drink, and stimulants	16,759
Light, firing and forage	1,461
Buildings	1,580
Vehicles and vessels	132
Supplementary requirements	1,232
Textile fabrics and dress	11,214
Metals and precious stones	3,711
Glass, earthen and stoneware	2,143
Wood, cane, leaves, &c.	3,790
Drugs, gum, dyes, &c.	456
Leather, &c.	3,242

Handicrafts.

23. Therefore the care of the Government and of the patriots is required not only for the mill hands, but also for the other large population that still subsists by handicrafts, and will continue to do so for centuries to come. These handicrafts are in most cases at present learnt and practised under circumstances which are very unfavourable to improvement; the natural result of which is that some of the artisans are being pushed to the wall with very little chance of recovery, as, their production, in these days, have to be compared in excellence or price with the imported machine-made articles; and it is a question whether the State and the people should view this decline with folded hands, and unconcerned attitude; or should try their best to rescue the dying industries from death, and so to place them that they may be able, with improved instruction, with better tools, with division of labour, and with organisations for marketing, to have another and permanent lease of life.

Chief Handicrafts.

24. Some of the handicrafts, which may still be saved from destruction and may be improved by assistance, in one or more ways above described, may be mentioned here. The list is by no means exhaustive, and others will readily suggest themselves to those who take interest in the matter.

1. Lac and Lac works.
2. Varnishes.
3. Vegetable Oils.
4. Oil Cloth.
5. Essential Oils and Perfumery.
6. Vegetable Dyes.
7. Hide, Skin and Leather manufactures in general ; Boot and Shoe manufacture in particular.
8. Horn and Bristle industries.
9. Handloom Industry, (cotton, silk and wool).
10. Artistic manufactures of cotton, silk and wool, such as gold brocades, silk brocades, gulbadans and muslins, printed cloth.
11. Carpet weaving.
12. Shawls and Pashminas.
13. Embroidery.
14. Woodwork and wood-carving.
15. Gold and silver smithies.
16. Brass and copperwares.

Power Industries.

25. Passing on now to Power Industries, by far the most important of the modern Industries of India are cotton and jute, which have made great progress in recent years. Of the two,

cotton as you know is mainly in the hands of Indians, and jute in the hands of Europeans. The cotton industry is principally carried on in the Bombay Presidency though a few Mills, both spinning and weaving, have been started in other Provinces and Native States; but the Jute industry has, so far, an exclusive home in Bengal. The Jute industry has much less competition to face in India, or as a matter of fact in the world, than cotton industry, which is exposed to the risks of competition, unfavourable circumstances, and adverse Government policy. Cotton Industry has, therefore, loomed much larger in public utterances than jute. But to those who look forward to an Industrial India, jute is as important a matter of concern as cotton; as a matter of fact, in one sense, it is more.

Jute Mills.

26. Out of the 38 Jute Mills, comprising 33,000 looms, and 6,83,000 spindles so far as my information goes, not a single one of them is managed outside or inside by any Indian. To the total paid up capital of 7·6 million pounds and debenture capital of nearly four crores of rupees it will be very interesting to know how much Indians have contributed. One might ask, is the blame in this case due to any Governmental policy; or to lack of enterprise on our side; or as some one is said to have remarked recently, it is due to physical and moral inaptitude of the Indian to manage a concern like a Jute Mill. Here is food for reflection for all of us, who are here to advance the cause of Indian Industries.

Cotton Industry.

Let us now turn to the Cotton industry.

27. There were at the end of 1910, 226 Cotton Mills in India, containing 79,000 looms and about 6 millions of spindles, giving employment to about 2,17,000 people. Being the largest Indian Modern Industry it deserves more than a passing notice.

From statistical returns it appears that Indian Mills produced 2,309 million pounds of cloth and 5,770 million pounds of yarn in the year 1910, and imported about 29 million pounds worth of yarn and cotton manufactures, and also consumed its handloom production, which is by no means a negligible quantity.

It is often urged that the countervailing duties, imposed in the interests of Lancashire, and the recent factory laws, also passed at the bidding of the cotton-opolis of England, are working against the development of this industry and are intended to keep the industry down, as far as possible, by artificial means; the natural causes also being by no means very favourable. Even the apologists for Government find it hard to refute the reasonable and justness of the charge so far as these duties are concerned, but they plead that India suffers no disadvantage as there is an excise duty of a similar amount on imported articles. There is hardly any hope of the repeal of these duties, until and unless the Government of India is granted what is termed fiscal autonomy. For fear of treading on the Political, and in this Conference, the forbidden ground, I do not propose to discuss the fiscal relations of India and England at length, but one remark may be hazarded, that if the fiscal relations of two countries are not adjusted on a fairer basis, there may be trouble, when the people advance in the knowledge of economic history and doings of civilised nations. The economic history of all the civilised countries, including England itself, is writ large in the word Protection; and we are denied that in the face of such well-informed opinion as that of the ex-Viceroy of India.

26. The Cotton Mill Industry being the largest at present and likely to grow, a fuller treatment of the subject is required.

(a) We are not on the same footing with Lancashire in point of supply of cotton. Freights on cotton from United States to Liverpool, would be, and are cheaper, than the freights to India on fine American cotton, and I believe the same would hold true of the Egyptain cotton. Therefore so long as the freights remain against us, *prima facie*, for finer goods, Indian must always depend on countries outside India.

The cultivation of finer stapled cotton, or the invention of machinery to produce finer yarn from present style of cotton, are subjects which should receive our earnest attention; and also everything possible should be done to improve the cotton staple. This is needed, as the trade of China, in Indian and coarse yarn, must decline in the event of Japan and China going in for Mill

Industry to a larger extent than what they have done in the past, of which there are already strong indications.

(b) The craft of the handloom weaver is also declining. It requires propping up by better looms, and a well-organised co-operative movement, to back him in the supply of raw materials, in marketing his productions, and supplying him with better auxiliary machinery, or auxiliary workshops, to finish his goods. If the weaver ceases to be the customer of the Mills for coarse yarn, which he has been weaving so far, more looms must go up to keep the spindles busy, and more power looms would require more cotton of the better type. This also furnishes a strong plea for immediate efforts to be made to improve the quality of cotton, and to improve the lot of handloom weavers.

(c) Further, Lancashire is said to possess an ideal climate for both cotton spinning and weaving. Bombay, Ahmedabad and Cawnpore have not yet made any such claim, and therefore the cotton industry is going on ahead, at almost all places, indiscriminately. Whether this policy is wise or not, when it is viewed from this standpoint, it is beyond my power to determine ; but this brings us back to the consideration of the question of hand spinning and weaving and power spinning and weaving and their comparative merits. If Lancashire's claim to *ideality* of climate is not based on cotton weaving by whatsoever system but by means of machinery only, made and initiated in that District, it behoves us to pay some attention again to the improvements of hand-weaving and to the consideration of the production of machinery suitable to our cotton and to our climates. The present cotton of India, in certain hands, and in certain localities Dacca, Aruni, Chanderi, Kotah, Rohtak and Banares produces marvellous results in fineness of yarn as compared with the production of the power spindle. Therefore the final word, as to the suitability of climate, and the inventiveness of man, has not yet been said, and India, if she desires to enjoy a respectable place as a producer of cotton goods, must pay attention to the production of cotton as well as to the production of machinery, both hand and power in addition to fighting fiscal battles.

(d) Again, compared with Lancashire we have to face other disadvantages, (i) the primary cost of machinery and the Mills in

India and higher ; (ii) the sizes of the Mills are smaller ; (iii) the efficiency of labour is inferior ; (iv) the rate of interest is higher ; (v) the cost of stores, sundries and accessories is higher and (vi) the efficiency of the onlooker is lower but his wages are greater. Now that the industry has made a fair advance, it is worth our while to direct our attention to these auxiliary matters as well, in order to lower the cost of production, and to be able to manufacture better articles than what we have been able to produce hitherto.

(e) England has thought it worth its while to combine to grow cotton for its Mills, to start Technical institutes and Laboratories, and to improve the knowledge and skill of the people. Various associations have been started to look after their various interests. It behoves us, therefore, all the more, to look into these matters more closely in all respects in order to assure further, steady and successful growth of the Industry and to guard it from dangers arising out of changing of habits in the people, and their ideal, and ideas as to what should they wear.

(f) Even if we successfully attempted all these, the fact cannot be ignored that Lancashire and other competitors of hers from Japan or America or Europe will continue to supply India with cotton goods. With our 79,000 looms we cannot supply Indians with more than 11oz. of cloth per head per year ; and we buy 1lb. 11oz. from Lancashire ; and already we weave at the handlooms a considerable quantity. With all this India is not properly clothed ; and the demand for clothing will continue to increase with the facility of obtaining it, and with the advance of civilisation. Some of us are old enough to realize that Indians, now, consume in towns and large sized villages, in some parts of India, ten times the quantity of cloth that used to be consumed less than half a century ago.

What quantity will eventually suffice to clothe the vast and growing population of India, it will be vain to guess ; the population of India has increased by 50 millions in the last thirty years, and what would be the further increase in the population, it is also difficult to foresee.

In view of this enormous increase in demand, and in view of the vast amount of capital and labour required, to work up even

a portion of our requirements, Lancashire need fear no competition from India, therefore I fervently hope she would of her own accord join hands with us to remove the disabilities under which our Industry labours ; whereby she will earn our gratitude, will make us its willing customers, and establish a good name for England.

(g) Before finishing my remarks on the cotton industry, I may be permitted to draw the attention of all concerned to the after processes of weaving, such as bleaching, printing and finishing.

In this connection again it is worth our while to consider whether home or hand industry as an auxiliary to the Mill Industry should not be introduced, revived and improved.

(h) The magnitude of the cotton industry, both hand and power as it exists at present, coupled with the fact that it is likely to grow faster than other industries, impels us to pay special attention to all the possible ways and means for its improvement. I would, therefore, humbly suggest the formation of an Association with headquarters at Delhi, the membership of which should be open to all the Mills in Northern India ; and I would further suggest the formation of one or more associations of the people interested in growing, in buying and in selling cotton. I would also suggest the formation of one or more Institutes of Mechanical Engineers, and carding and spinning masters, which associations should try to improve the industry from the special points of view, in their special knowledge, and forming their special concern. I may also venture to hope that one or more banks will be specially organised or one or more of the existing ones will specialise in financing cotton trade, cotton industry, export of cotton and import of cotton goods.

(i) There are two questions still left over in connection with the cotton industry which will be treated in their proper places. In connection with other matters, I will hereafter refer to the transport of cotton and cotton goods by railway, and the arrangements for the furnishing of Technical knowledge to the people. The trading in piece goods as in other goods should be

viewed in the light of my remarks on commerce and trade which follow in due course.

Other main Industries.

29. Gentlemen, a few remarks only will suffice with reference to other main industries.

Other main, but smaller Industries, which have so far been tapped in this country are paper making, beer brewing, and wool-weaving. Steam power has also been applied to flour milling, oil crushing, cotton ginning, printing and railway works, with more or less indifferent success. Glass making and Indigo factories were started but they have almost all disappeared. Of these, Woolen Mills, Brewries and Paper Mills are the outcome mainly of European capital and enterprise, and the others (excepting Railway workshops) mainly of Indian capital. Indifferent success in these concerns is due to various causes; in some cases, for example in the case of ginning and flour milling, it is due to the overbuilding of factories and building of factories in unsuitable localities; in case of paper making it is said that cheap wood-pulp has adversely affected the industry; in Indigo, the discovery of synthetic indigo has killed the natural plant; and glass making, it is alleged, was attempted without sufficient skill and sufficient knowledge of conditions, under which it thrives. The Industrial Conference lately passed a resolution asking people to study the causes that have led to failure, with a view I trust, of improving the chances of further efforts. I have mentioned here some of the causes which have hitherto effected adversely several attempts that have been made, but one cause which has, I believe, more than any other, contributed to the decay and death of the new budding industries has been the absence of knowledge of business ways in the promoters of these schemes.

In addition to above, want of capital and employment of inexperienced staff, will also account for several cases of failure

think a careful enquiry should be made into the causes but not by the people in a haphazard way, but by an experienced man sent out by the Industrial Conference.

Causes of Decay and Growth.

30. One word with reference to the decay of our ancient Industries and to the causes of the Industrial growth of other nations and countries may be permitted.

The story of muslins, brocades, carpets, iron and steel manufactures and goods of similar nature, manufactured in Ancient India, which drew the attention of the world, has so often been told that it does not require to be repeated. But we must remember that their death was not due mainly and solely to Tariff wall, but to causes which are even now potent in making and unmaking Industries. It is only by a grasp of the true situation, and by adapting ourselves to new conditions, that we can advance Industries in this land. These conditions may be summarised as under :—

1. Discoveries of Science, which were always utilised in practice.
2. Application of machinery, which was invented, made and used as needs arose.
3. Utilisation of coal and water or other powers of nature, to reduce the cost of production by reducing the labour bill.
4. Factory system ; Associated efforts.
5. Easy and cheap transport, by land and water.
6. Commercial and Industrial enterprise throughout the peoples of the country.
7. Division of labour ; which helped specialisation.
8. Cheap and sufficient capital.
9. Favourable and helpful attitude of Governments, at home and in International relations.

10. Adaptable social and religious systems, to help in the readjustment of new factors.
11. Co-operation of women folk, who in the East act, sometime, as a brake on the wheel.
12. Competition and avoidance of competition as required by the dictates of prudence and wisdom.
13. Combinations.
14. Utilisation of By-products.
15. World Markets.
16. Literary assistance.
17. System of Insurance against the risks of fire, water and earthquakes.
18. Simultaneous growth in all directions, and
19. Latterly Technical Education.

Gentlemen, it will be impossible to attempt a complete thesis on these important subjects, but they have to be fully understood, both in theory and practice, before we may assume that we have fully grasped the situation. We want Industries, but before we could have them, we have to equip ourselves with all that is required to become a successful Industrial people, and it is with this desire that I have taken up your time in enumerating certain preliminaries that are essential in an Industrial age, and I hope the younger generation will take them into their best consideration.

31. Gentlemen, my predecessors in this Chair and others, from time to time, have laid special stress on the four requisites of production, namely, (i) Capital, (ii) Skill, (iii) Labour and (iv) Markets, and my immediate predecessor has further brought in the (v) necessity of Social Reform into discussion, and has also advocated (vi) Fiscal Autonomy as a necessary condition of Industrial improvement. It will serve no useful purpose to re-assert the arguments in support of their position, as I am generally in

accord with most of what they have said, and those who have had opportunities to study closely the difficulties that are retarding the Industrial advance of the country feel that these, amongst others, are the unfavourable factors that we have not only to contend against but eventually to overcome. The workers and thinkers of India, in this domain, are coming into a unanimity of opinion which establishes the strength of their position. I will however offer a few remarks in passing on these subjects in the order in which they have been mentioned, and I trust they will receive your indulgent consideration and may arrest the attention of others.

Capital.

32. Let us take capital first. Capital and plentiful capital is a great necessity. It has to be collected and made available. *Whence and how* are the questions with which we are concerned. It has been suggested, that with Government aid, we ought to be able to coax foreign capital; it has also been said that India possesses immense hidden treasures which ought to be, now made available for the economic development of the country. We have, as a matter of fact, to tap both the sources, with whatever results luck may have in store for us; and we have also to create capital by savings, avoidance of waste, and to turn our earnings into interest, dividend and profit-earning channels. All the three sources combined, will hardly suffice for the immense amount of capital required for the development of the country; and we must be prepared to exercise some self-denial for some time at least in the way of reducing our jewellery bill, and bill for fine clothing, by giving fewer marriage feasts, avoiding too massive buildings, and the luxury of English education for our First Arts-failed boys. We cannot have capital, if we do not save. We cannot have capital if we do not make small capitals pay. We cannot reckon on large sums of money being available as capital, if we do not organise. Therefore we must save, invest and organise before we could have a capital Fund to back our industries.

33. You are aware, gentlemen, that already foreign capital is playing a part in the economic situation of India. Jute Industry, Tea, Coffee and Tobacco industries, partly Indian Railways, Indian Canals, partly Indian coal and Cotton Industries, almost

the whole of Indian petroleum, and almost the whole of our foreign commerce, are financed by foreign capital and it is now realised that we are paying too heavy a price for it. This happens in two ways. Excepting the case of canals, where we pay only interest on borrowed funds, and railways, where we keep back a share of earnings all the earnings, of capital in other cases belong to the Foreign capitalists, and in all cases, including railways and canals, the best paying and most honourable positions are also reserved for the outsider. It has been said by my predecessors that we do not want any more foreign capital with such onerous conditions. The best terms, they think, that should be offered now are a fair return by way of dividends, or interest, and a share in the best positions not exceeding half. This could be secured, so far as the Government monopolies are concerned, by throwing open half of the best appointments, from top to bottom, to Indians, who will, I hope, take no time to qualify themselves; for these honourable and responsible positions, if these appointments were once made available. All tall talk about want of stamina, want of independence and pluck, is a pure invention, without any real foundation; and all these imagined disqualifications will disappear as darkness does before light. Foreign capital at present flows into these monopoly channels and into exclusive concerns; whether it would flow into pure Indian or mixed concerns, is mainly a question of credit in the foreign markets; and the best way to achieve the object, in my humble opinion would be to introduce large and well-considered schemes with mixed boards. But schemes which are State-aided or aided-by-Native States or local bodies, will have a better chance. Hydro-Electric Schemes, Tramways, Gas Companies, Water-works and the like, which easily lend themselves to this condition; will command easy underwriting at the European exchanges. This brings us to the consideration of a large fiscal question, as to whether the Local Governments, Native States, and Local Bodies should have independent powers of borrowing, and initiation of schemes; or should they always go to one Banker, the Government of India. This is a large question and involves a variety of considerations, which must be left over for others to tackle.

One other way to coax foreign capital will be through the Exchange Banks on existing securities, which can be well tested and examined. The third way to induce foreign capital is by

means of commerce, which will receive some attention in this address at a later stage. What we want is the *method* of inducing foreign capital into our country and not merely the opinion that foreign capital should not be scorned. As a matter of fact, so far as my knowledge goes even the boy-cotters did not advocate that policy.

Home Capital.

34. While on the subject of Capital, a few more words are needed on Indian capital. Foreign capital being any case a problematical question, home resources are the surest to avail of, and these must be multiplied as fast as one can do it. The organisation of Banks ; and the flotation of Joint Stock Companies, has tempted some capital to find its way into the domain of industries. At present these are only test measures, and the future influx of capital through these channels, will depend on the successful engineering or otherwise of those concerns. As the success of a new business depends on a variety of circumstances, it is not always easy to pilot every scheme through ; but nothing succeeds like success, and therefore it behoves us, the pioneers of Industries, to go slowly along, and to watch carefully every step for fear that we may have to take. The failures of the last few years, in the sphere of Joint Stock Companies, should be very carefully studied, and the true causes of failure accurately ascertained and measured, and they should be given sufficient publicity to, so that new comers may avoid the mistakes that were perhaps inevitable for the first venturers. I have not time enough at my disposal to probe the enquiry any further than merely alluding to it in passing, as I have done already but the subject is well worthy of the attention of the Conference. I will again draw special attention to one cause amongst others, and that is the inexperience of topmen in business, and the lack of sufficient supply of men who will assist the topmen by hard study, by careful observation, and by ready adaptation. I hope this phase will soon pass away, and past experience will lend knowledge and strength to the new comers. The Government, the native rulers, the public bodies, and the patriotically inclined gentlemen could do a lot in helping the cause forward by publishing in advance well-considered information on any new scheme put forward, and if the

commercial department of the Government of India leave off its traditional shyness, and advise and seek advice and communicate the same to the new venturers it might do a real yeoman's service. This much about the direct accumulation of capital.

Banking.

35. Now let us turn to indirect sources. The source at present available is Banking. This has been well launched, but it must be now very carefully watched by all interested in it. We should not multiply the number of Banks, and thereby produce weaklings; we must stick for sometime at least to near about the number already floated, and our first effort should be to strengthen them and enable them to fulfil their mission. Their mission is two fold. First two attract small owners of capital to part with it for safe custody, easy return and some profits; and, secondly to help forward all honest enterprises in the domain of commerce and industry. Any mistake made on either side might have disastrous effects, and put the pendulum back for a long time. It behoves, therefore, all of us interested in the economic welfare of the country to establish a sound and solid banking system in the land. With the number of Banks already started, I would propose the formation of a Banking Association, without any loss of time; and would urge thereby the discussion from time to time of questions vital to the existence, continuance, permanence and prosperity of the Banks. This Association we require very badly, and the sooner it is started the best for all concerned.

36. You are aware that the present Joint Stock Banking of India is divisible into Exchange Banks with foreign headquarters; the three Presidency Banks governed by special laws; and the Discount and Deposit Banks, as they may be called, under European and Indian Management. The first named Banks, excepting perhaps in Presidency towns, are mostly concerned with financing commerce; the Presidency Banks mostly deal in discount, but the other deal with internal exchange, discount, money lending and what not. The Co-operative Credit Banks, I am sure, are doing immense service to the agriculturists, but at present are small; though they are growing institutions and have possibilities of much growth. Banking like irrigation, and capital

like water, are required everywhere. There is more demand than the supply can cope with, and there is temptation to serve the first comer. I would therefore venture a suggestion, and that is the specialisation of the Banks on their investments side : agriculture, trade and commerce ; special trades and industries, like cotton and jute ; real state, and the small borrower, all must have access to Banks ; but to special ones only. The advantages of this division will be many ; the interests paid on deposits will depend on the rate of interests likely to be earned from the special branch of business, for which the Bank will cater ; the safety of investment will be insured, because that will form the special knowledge of the Managers, and the Directors ; and all economic activities will receive help in proportion to their merits ; and undue and untimely competition, already visible, will be avoided. It is not only in the reduction of profits that competition manifests itself, but also in making unsafe investments.

37. While on the subject of Banking, a very useful system of Banks could be devised by the help of Native States ; somewhat on the lines of Presidency Banks and Discount Banks, combined ; but this subject can be usefully dealt with only when the Political Agent turns his attention to the economic side of the development of the States ; and is spared somewhat from Ceremonial duties from duties of guarding the morale of their wards, and from dealing fair between contending parties.

So far I have dealt with the main indirect method of collecting home capital.

Insurance.

38. The other indirect source of collecting capital, in all civilised countries, is the development of Insurance in all departments of human life and activities. In India the first Life Office was started with the hobby of Government securities, and that idea has got hold of the brain of many people ; officials and non-officials alike. The history of Insurance Offices of all the world, and a glance over the lists of investments of even leading offices of England establishes my contention. I would, therefore, unhesitatingly draw the attention of my countrymen to this branch of financing institutions, and would like them at once to combine

into an Association, to develop Insurance on healthy lines, covering all departments of risks. The country is vast, the population is large, the ills and risks to which it is subject are more numerous than anywhere else ; therefore it stands in greater need of real protection by insurance, than the population of any other country. Afford protection and real protection to all; and indirectly bring together small sums of money to swell into much. This will form a rich source for collecting capital.

Digression.

39. I may be permitted a short digression. Our Government is really a *Ma-bap* Government. It acts like the aged couple who in their dotage have to deal with a weakling child. The little one should be protected from all harm. So our Government, without any cause or call enacts factory laws, Boiler Acts, Insurance Laws, and what not. We, as children, need not quarrel with our over-anxious parents, but we must try to get strong so that this over-anxiety on the part of our *Ma-bap* Government may be over. This is all that I think should be hazarded on this question of legislative interference, where no interference is called for.

This leads us to another aspect of the question, namely, the production of stuffs so largely used by Government departments by means of *pioneer* industries which may after a while be transferred to the people on payment of a portion of the money in hard cash and the balance by way of deferred-payment debentures. This would, in my humble opinion, be a better way of introducing new Industries in the country than the suggestion that Industries started by foreigners may be repurchased by Indians at a Government valuation. This will not militate against any phase of Free-trade, Free-manufacture and Free-exploitation of India by the people of the whole world.

Village Banks.

40. One word with regard to village Banks or Co-operative Credit Societies, as they are now termed. At present they need urban support, which should be unhesitatingly given by the people living in the towns. This measure will relieve agricultural indebtedness, may relieve real misery in many cases, and it will

directly and indirectly help agriculture, the real source of India's wealth and prosperity. If the village Banks and the village Co-operative Societies are helped in a whole-hearted way, the time may not be far distant when the village Banks may advance and become the tributaries of urban and other Banks. According to official ideas and expert statistics it is the agriculturist who is absorbing the gold that is now flowing in from year to year, and if confidence is established amongst the village folks to entrust their small savings to these Credit Societies, then when they swell beyond the village requirements, they are bound to find an outlet in towns and cities. This again is a source of collecting capital which should not be overlooked.

Other Means of Collecting Capital and "Swadeshi" applied to Capital.

41. In more advanced countries there are other financial institutions, besides Banks and Insurance Companies; and besides 'Government or local bodies' loans—there are Financial Syndicates, and Trusts, Friendly and Building Societies. But here, perhaps, the time is not yet ripe for these. But for one thing we ought to be ready; and that is the capital organization of *Swadeshim*. Every publicist says something about Swadeshi. Everybody likes Swadeshi, if it is honest. The Government alleges its adherence to Swadeshi, if it is Economical and not Political. It has been argued that Swadeshim is an excellent doctrine, if it is applied to *production*; but it is mischievous if it seeks to capture *distribution*. Swadeshim, as capable of affording a permanent protection to indigenous industries, has been poohpooed; and it has been doubted whether many of us are real Swadeshis. I personally did not join any Swadeshi Propaganda, when it was in its ascendancy, and when an Indian was considered a black sheep if he did not openly profess himself a Swadeshi. The storm has now passed, and a quieter view of the Swadeshi-force has to be taken. Swadeshim or the love of the country on its material or prosperity side, is a force; it is a noble force, and therefore an effective force; but it is split up into small bits; its individual strength being equal to the possible voluntary sacrifice or service that an Indian adult, man or woman, is capable of rendering, without crippling his or her other activities. This then is the force which

may be translated into direct money contributions, with an expectation of only a small return, to form a nucleus of capital for initiating industries, and introducing young men into business careers. It requires organising, but I am fully convinced that it is capable of organisation. Individual contributions may be small, but the cost of collection, management, and distribution may be nil or negligible. This should be attempted by younger hands, under the guidance of older heads. We may thereby tap an artesian stream, an artesian stream of Swadeshism, which will do a lot of good in watering our parching fields.

Skill.

42. I presume I have said enough with reference to the first factor of production.

Let me now, gentlemen, turn to the second factor of production. It is technically termed *skill*, but includes a multitude of requirements. In this connection our attention should not be focussed on mere steam power factories, but on all factories, big or small, hand-worked or power worked, which are engaged in the processes of manufacturing useful articles of food, apparel, habitation, enjoyment, transport, and intellectual and physical advancement. We find, by comparison, that both *hand* and *power* productions of India are much inferior to those of Europe, America and Japan in the following respects. They are poorer in design, execution, and finish; and therefore they fetch less value, and are much less appreciated; and they are hardly able to hold a place before similar articles of foreign manufacture. Let free trade be assumed to be justified, let the right of England to dictate terms with regard to exchange of commodities be admitted; and let the better and older organisation and the world-marketing of Europe be accepted as factors against us, but still there is no reason why India should not be enabled by training, to manufacture some of the articles at least, for which she has her own raw materials, for which immediate need for deep scientific knowledge does not exist and for which she can, even with her scanty resources, find the required amount of capital; and lastly, which her own sons, if better trained, could manufacture; and which may have to be consumed in India itself. There is again no reason why India should not

be enabled to produce, for her own use at least, articles, which have not any trade secret behind them, and which can be produced with the use of a set of better tools, and by a little training in handling them. Once again there is no earthly reason, why India should not be in a position to manufacture, in the country, articles which do not require application of chemistry or other practical science, but are produced by mere mechanical processes, provided proper machinery is made available and their handling is taught. Thus there are several avenues where increased skill would arrest decay, improve the standard of production, and introduce new manufactures, akin to existing industries. To produce such articles economically, skill should be made available for all concerned in the manufacture, and not for mere worker with hand and for those who supervise.

Who should do this and *how*; these are the two questions to be answered with reference to this subject; and these should be answered before going into the details of arts and industries requiring assistance in this direction?

43. The first party to be considered in this connection is the Government. At the threshold of all demands for technical education, we are invariably met with the stock argument that India lacks initiation, and the Government is asked to do in this country what is not considered the duty of State in other lands. My reply to this is "I beg your pardon." The conception of the functions of the State in these days is very different from what it was in ancient times. The component parts of a State are also now different from what they used to be. The ancient State consisted of the conqueror and the conquered, where the conquered had no voice in the management of affairs. Now even when the State does not consist of the people themselves, the subject races have been generally admitted by all great powers to a share however limited in extent in the Councils of the State, and therefore it is composed of people and the rulers in various degrees of co-operation. A small measure of such co-operation has been graciously vouchsafed to us also. Again, the State Revenues do not consist now merely of taxes raised; but also include the profits of large monopolies, such as Railways and Irrigation in India. The Government everywhere has, for one reason or another which we need not stop here

to enquire, proclaimed itself responsible not only for the *peace* but also for the *prosperity* of the State. The whole consular system and all the present day international treaties bear out this contention. The Indian Government also is therefore responsible not only for a programme of peace, but also for our prosperity. Following the dictation of this well accepted doctrine, it now presents annually to the Houses of Parliament a statement entitled "a statement exhibiting the Moral and Material Progress and condition of India." Therefore it cannot very well disassociate itself from this duty.

44. The next question that arises is as to the extent of prosperity which it is the duty of the State to provide. Does it extend to the provision of subsistence wages only for all its subjects, or does it extend to the provision of palaces for all to live in; and mushrooms and oysters for all to feed upon. A reasonable answer to this enquiry appears to be, that the standard of prosperity of India should not be lower than that of any other country, which is governed by equally civilised and enlightened rulers. I do not mean that it should be equal to that of England and France, because therein we shall have to face the further objection that those countries had a long start in the race; but surely Germany and Japan had no such advantage, before the end of the first half of the last century. Well, we shall have again to face a further objection that the people in these countries have helped themselves irrespective of the efforts put forth by the State to help them. [reply, have we not done so? Which technical school of Agriculture, Forestry, Mining, Engineering, Medical or Law is without its pupils, and without pupils from the best stock of the land? Have we not also contributed our mite to the establishment of Technical Institutions? The latest report of the Peripetatic Committee on Technical Institutions bears witness to this. Practically most of the advanced provinces have already made attempts to found private Technical Institutions, and the Government has also founded some. Apart from this aspect of the discussion which leads us to the conclusion that the people and the State must combine for the advancement of Technical skill of the people, the Government has not taken up the question as a whole yet; though the people have been demanding it for over a quarter of a century; and though there have been held many committees, enquiries and con-

ferences. What is really wanted, is a facing of the problem as a whole, and the creation of an organisation or organisations to meet the every day growing and varying wants of the people in this respect. General primary education in every province, is in the hands of a Director of Public Instruction. A similar officer, as an Assistant Director of Public Technical or Handicraft Education, should be appointed in each province, with a similar system of State schools and Aided schools and Private schools open to Departmental inspection. The Higher General Education in various provinces is looked after by Universities, composed of Senates, on which are represented members of all faculties with a mingling of high placed officials and magnates of the country. Similar Bodies are required for looking after the Higher Technical Education of each Province or to start with each Presidency. The existing universities show a tendency towards becoming Teaching Institutions in the near future. The proposed Institutions should be teaching institutions from the very start. These composite bodies may be constituted in the same way as the Senates were constituted before Lord Curzon's University reforms were introduced. Without such organisations, it is difficult to conceive how this problem can be solved. The problem as stated above is changing every day with the change of the ideas, habits, ideals, and ambitions of the people, and so should Technical Education adapt itself from time to time to varying conditions; and this adjustment can only be done by a watchful body as here recommended.

Technical Education.

45. So far we have seen that it is absolutely necessary, for reasons assigned, that Technical education should be advanced, and that the Government and the people should join hands in meeting this urgent demand of the country. But there are a few special features of the subject which should not escape a passing notice. I have said above that the modern State is responsible both for the Peace and Prosperity of its subjects; and it adds considerably of its duties and responsibilities, when it becomes a monopolist, as the Government of India is in several material aspects. It has the practical monopoly of Forests, Railways, Irrigation, Post and Telegraph Offices, Roads (this latter monopoly it shares with local bodies and States) Mint, Excise,

Stamps, Geological and Archæological Surveys, and Public Health. It is also the largest owner of Public Buildings and the largest publisher in India, to mention only the principal monopolies and a few big undertakings. Every employer of labour and especially an exclusive employer has a duty, apart from State considerations, to improve the efficiency of its labour, and to seek out means by which to decrease the cost of production, and to employ people, more and more, who are near at hand. Now, have these Departments so far looked into the matter from the business point of view? The unhesitating reply is 'No'. There are, I would not ignore, Civil Engineering Colleges and a Forest School and Medical Institutions, but even in these departments the colleges are admitted to be inefficient and ill equipped, as we have not found any of their alumni, in the space of a quarter of a century, to have been placed in charge of a *directing* position, or where *highly technical knowledge* is required. In this respect the duty of the Government is quite obvious, and it should not be overlooked any longer. Railways and other technical departments have been in existence for over half a century and it is high time that the Government did its plain duty in this direction.

A Bye Question.

46. Now let us look at the subject from another standpoint. "The Government recently sent out two experts to wander about the country, to enquire about the wants of the employers of labour for technically trained men and to bring technical institutions into closer touch and more practical relations with the employers of labour in India." The scope of their labours was therefore very limited, and it was further limited as the professions included in their enquiry were only :—

1. Civil Engineering.
2. Mechanical Engineering.
3. Electrical Engineering.
4. Textile Manufactures.
5. Mining Engineering.
6. Industrial Chemistry.

and "the inception, organisation or improvement of Industries" was excluded from the scope of their enquiries; though the "Grades of the *Personnel* of the profession was included in the enquiry."

This shows how limited the scope of the enquiry was, and even in this limited sphere of activity we need hardly except grand results as there is no machinery at present existing to which, regulate, readjust, and duly expand technical education. An organisation of this nature is the first and the most important step towards the realisation of the object. The general recommendations of the Committee, however, are as follows :

"(1). The existing system of training for the Civil Engineering profession in Central Colleges is the most suitable one for the requirements of India.

(2). Apprenticeships for one year on practical work in the Public Works Department should be granted, if possible, to every student passing out of a Civil Engineering College.

(3). There is practically no opening at present for the employment of high grade mechanical or electrical engineers whose education is mostly of a theoretical character.

(4). There is a very large opening for the employment of men in mechanical and electrical engineering, who after training in a properly equipped Institute, are willing to gain their practical experience by apprenticeship on a living wage, work with their hands, and observe factory hours and rules. This employment is open to Indians of every caste or creed, grade of social position or education, provided these conditions are observed; and the height to which they can rise depends on their individual characteristics.

(5). The best method of training men in mechanical and electrical engineering to meet the existing demand is by a course at a well equipped Institute, followed by an apprenticeship in works. Institutes should not grant any certificates till this apprenticeship is satisfactorily completed.

(6). The education given in the Institute should be essentially practical be capable of being applied commercially, and not of such a high scientific character as is often considered necessary in the West.

(7). Large mechanical and electrical Institutes are, at present, only necessary in those provinces in which industrial development is well advanced. Minor Institutes should be properly endowed, equipped with adequate staff and apparatus, and placed under proper control as regards their courses and certificates.

(8). The staff of all Institutes should be carefully selected, and consist of men with the necessary theoretical attainments and extensive practical experience. To keep in touch with the various industries, the staff should be permitted to take up consulting and advisory works as opportunity offers.

(9). The scheme recommended for technical education for the mining industry is detailed in paragraph 203.

(10). Apprenticeships after a course at an Institute as detailed in recommendations 4 and 5 are equally necessary for technical education in the textile industry; in which the courses in spinning and weaving should be separate ones.

(11). Afternoon classes for textile jobbers and mistries should, if possible, be instituted in suitable centres if a satisfactory demand exists, to practical demonstrations in the vernacular on the theoretical side of their work.

(12). Arrangements should be made for the permanent co-ordination of the relations between institutions and employers of labour by the appointment of a controlling officer, and the establishment of an employment bureau."

As in duty bound and in our own interest we must endorse these recommendations, and draw special attention to the last (para 12) and strongly urge the necessity of the immediate creation of the appointment, recommended to be made and the establishment of an employment bureau.

47. The report referred to above raises several other very important questions, with regard to existing institutions and their equipment with regard to the classes of people that at present avail themselves of the benefits of Technical education, and with regard to the opinion of employers generally as to their fitness for work. These experts have also discussed the greater suitability of the inhabitants of certain provinces for special classes of work ; they have reviewed the effects of the present methods of recruitment of technical scholarships tenable abroad. The reading of their report affords much food for reflection ; but it is not possible to review the report at any length here but earnest attention of all our public men is invited to its consideration.

It is increasingly obvious in politics, as well as in matters of technical education, and another walks of our public activities that specialists must now complement and supplement the efforts of the Publicists and that a division of labour in our public men is now very urgently called for. It is now impossible for any one to be a leader in politics, social reform, business, Agricultural and Technical education at the same time, and the sooner we realise this the better for our prosperity ; and the solution of many pending questions which hang on for want of expert handling will be discovered. Whatever may be permissible in other walks of life experts in technical education are much needed.

48. I do not propose to make many more references to this report but with reference to one matter one must offer a few remarks.

I am referring to Technical Education as applied to Railway administration. This part of the report ought to be very carefully studied by those who are interested in the practical solution of this much vexed and important question, and they should take action or make representations in the light of practical criticism. The report frankly admits the importance of this branch of the subject but does not deal with the whole question exhaustively ; and the enquiry stops short at the supply of Permanent Way Inspectors. The report says, " The Railways in India require a separate chapter, being by far the largest employers of technically trained Indian labour. They present, however, several unique

features. They almost universally wish to employ and train the relations of their employees, they have their own system of Railway schools, and in many instances have systems of technical education of their own."

The importance of the subject is admitted but the recommendations, so far as the Indians are concerned, are not whole-hearted, but a beginning has to be made and this ought to receive special attention from the Press, the public, and our representatives in the Council. We must thoroughly agitate for this; and similar remarks apply to those other departments of the Indian Government where technical knowledge is required.

Labour.

Let us turn to Labour itself now, as distinguished from skilled labour.

The Time-honored impression about the labour supply in India has been that it is plentiful and therefore cheap; this impression has also been taken from their cheap living and abstemious habits. But this impression has now been entirely upset. It is now admitted that in India labour is very scarce, inefficient, and therefore very costly. The difficulty produced by the rise in wages is being felt in all walks of life and activity; particularly as it is not accompanied with a corresponding rise in efficiency. The Hon'ble Mr. Dadabhoy thinks (*a*) that free and compulsory Primary education will instil healthy sense of duty and ambition; (*b*) that the supply can be improved by stopping oversea emigration; (*c*) that free movement of labour should be encouraged by repeal of laws such as Assam Labour Law, and finally he recommends to get over the difficulty by (*d*) the free introduction of labour-saving appliances.

49. Labour saving appliances and greater use of steam and water and electric power, if fairly well developed, may reduce the labour bill, but the problem is by no means solved if we have any dreams of an Industrial India. Industrial India wants a very large quantity of labour and very *efficient* and *conscientious* labour. There is no doubt that the material is in the country; and it seems it will be inexhaustible for a long time to come. I always

believed that that was the greatest economic asset of India; but when the greatest economic asset is put in the market it turns out to be immobile, indifferent, and therefore of almost no value. This is a very serious question, and deserves the attention of all employers of labour. To my mind the greatest reason for the deterioration of labour in the country is the example of the onlooker; both European and Indian, who does not put his whole heart into his work and who does not set a good example. A European employee, on Railways for example, is a little likely to take off his coat as an Indian. It is not due to his incapacity or indolence, but is due to fashion, and it is considered beneath one's dignity in this country to do so. A Mem Sahib perhaps out here does not do any dusting of her house in the fashion she does in England, because at one time she believed in the cheapness of labour and possibly in maintaining her dignity. Her imitator, Indian lady, dresses in silk, and does not put her hand to any household work. Large works of Government are constructed with an haphazard watching of labour and the tone of labour has become deteriorated by the bad example of the men employed to supervise it. Until the Government changes its standard of labour and its high placed employees become more Europeanised in this respect than Orientalised, the difficulty will remain. Railways especially have a larger scale of establishment than is necessary, and as the Railway is now almost everywhere, the tone of labour is everywhere being affected in efficiency thereby. I have often questioned an Indian employee of Government on the subject, and have invariably received the same answer that "*Uffisar log kam nahin karte*". I hope I will not be dragged on coals for this, but this is the far-reaching reason that accounts for the deterioration of labour.

50. Next to consider is the efficiency of labour. Labour in India is quite inefficient and so are we quite unpractical. Are we not told every day, and do we not realise in our lives every day that we are the best of us, less practical, than the people of Europe and America? Do not then the two statements amount to the same thing told twice over? Is not this the labour-translation, of what we have been often told and we have ourselves realised that *introspection* rather than *observation* has been our habit? Exclusiveness and not assimilation has been our life-principle. If the

view thus expressed be correct, then it behoves us to go deeper into this question than we have hitherto done and the efficiency of labour and conscientiousness of labour, whether it is educated or non-educated, whether it is urban or rural, whether high or low, should form the subject of much serious enquiry, much thoughtful readjustment of ideas and habits, and great efforts should be made to improve it. The easiest start in this connection is the setting of an example by those who are in a position to do so. This to my mind is at the bottom of all indifference, want of skill and attention, that we find in the labour of India; and one cannot lay sufficient stress on this very important aspect of the problem. I pass on now to the question of quantity of supply, as distinguished from quality.

51. The insufficiency of supply is in some cases due to want of information in the rural districts of the demands of industries and towns; and when labour does want to shift they don't know whether to go to Patna or to Dacca, for employment; and they have not even the means of finding the Railway fare, for their intended journey—nor the means to find food for a number of days and to leave sufficient for their dependents behind. They do not know where to turn to. The village is so constituted that each unit of labour has a duty assigned to it, and has an assurance of life's wherewithal, if everything goes right at the harvest time. Now to break off from this chain requires courage, sufficient knowledge, certainty of finding employment, as well as the suitability of employment; and also employment for a certain number of village companions, to stand or fall together, and to be the support of each other in times of distress and affliction. If means are found to overcome these and similar other difficulties and the capitalist employs proper agencies for recruitment of labour, and budgets for recruitment expenses of labour in his prospectus, things are likely to improve, so far as supply is concerned. It is only a question of measures, wise measures.

Coming now to the subject of marketing.

52. It has been suggested that the well-known methods of marketing of goods such as holding of Exhibitions and fairs, and of advertising are badly needed to help the enterprising and the

struggling manufacturer on. I fully endorse this view, but this brings us to the consideration of a very vast and important subject, which has hitherto received very inadequate attention at our hands. I am alluding to Commerce.

Commerce.

53. The Theory and Practice of modern Commerce is not the subject to which I am alluding, but the handling of the commerce by Indians themselves is the point at issue. We have a very brief history of Indian commerce; we have been told that we sent out goods overland to the countries of the West from time immemorial, and we also know what articles were exported. We have also been told recently, on good authority, that to the East of India we sent out certain ships of our own manufacture and ownership, which are mentioned in ancient literature; and the pictures of which are to be traced on Indian monuments. This may be very interesting, and very inspiring; but had we ever any respectable oversea or overland trade which we handled ourselves. Vasco de Gama rounded the Cape of Good Hope in 1498; and we were discussing late in the seventies and eighties of the 19th century, whether we could take a sea voyage without being eternally and everlastingly damned here and hereafter. I hope we have settled and ended this question forever now, though even now one hears foolish talk sometimes of chartering a Hindu excursion-ship, to maintain and preserve our prejudices. I am aware, that against my wholesale condemnation of our attitude towards foreign travel and Commerce, I will be appointed out at once the example of Hindu Shikarpuries and Sindees; and the more recent example of Borahs and other Mohammedan castes, so far as Asiatic trade of modern days is concerned. But this is so insignificant in volume, that even mention of this is not made in official Records and Returns. The old-day Shikarpuries were not carrying on much International commerce, but were mere adventurers into the lands of less adventurous people of Central Asia, and by residence and trade there, for some years, brought riches to their land. It may be very commendable but is not quite to the point.

54. I will not attempt here an historical sketch of overland trade of India in early or mediæval times as I am not concerned so

much with the goods ; as with the agency which carried on the commerce. Commerce there is already enough between other countries and India ; as a matter of fact empires have been lost and won in consequence ; Countries and Continents have been discovered ; and Countries have risen and fallen in search of our commerce, but we have not moved.

55. The present commerce of India is chiefly with countries lying to the West, though Japan, China and Java lying to the East are also coming in. The volume of our seaborne Foreign Trade including treasure in the year 1911 touched the total figure of $260\frac{1}{2}$ millions sterling, divided into $155\frac{1}{2}$ millions and 145 millions of exports and imports respectively in addition to some Frontier trade. Who handled all this ? From loading into the Railway trucks, to the place of consumption, in the case of exports and from the place of manufacture to almost our doors, in the case of imports, we do not deal with it. We buy and sell in our towns and our villages, and we have nothing practically to do with it beyond our noses.

56. The fact that our commerce amounting to $260\frac{1}{2}$ millions of pounds a year is handled by others, means a loss to us of all charges that are made for its transport, for its insurance, for its financing and for the handling and remission of its price. What percentage does this come to ? Shall I say 5%, covering all charges or shall we take it at even less. At 5% it comes thirteen millions sterling and over ; at 4% to ten millions sterling and over ; and even at one per cent it means at least two and a half millions sterling. The magnitude of these figures will be clear when we remember that the paid-up Capital of the three Presidency Banks of India will be covered twice over by even one per cent secured on our Foreign Commerce.

57. Now I have laid special stress on this matter, as I believe Commerce is easier than manufactures, and because there are vast openings, if we only set about them. I am aware of the competition and jealousy ; I am also aware of the difficulty of languages, and in our case also of social and physical habits of the people ; I am again aware that there are vested rights and special privileges ; but these factors are also present, in addition to several others, in the case of manufactures. Therefore, commerce

is comparatively easier to handle and to master, and it follows that it should be taken up seriously and without loss of time.

58. The difficulties in the way of our entering foreign trade will melt away by themselves ; first because (1) the Commerce of India is bound to expand and we can catch a part of the expansion ; secondly because (2) the Commerce of India has to change its channels, as countries other than England have also become manufacturing countries, and are evincing keen desire to push their oriental trade.

The advantages of adopting a life of commerce would be many ; as in addition to pecuniary advantages, to which all economic life aims, we will be able to buy in the cheapest market, and to sell in the dearest ; we will learn what other people want from our resources, natural and manufactured, and we may tap, to our advantage, resources and sources hitherto unknown to us. We will also have opportunities to gain experience in manufactures, and methods of business, of large organizations of advanced countries, which experience, unfortunately, cannot be made available for a sit-at-home Indian or even to a traveller. A traveller may collect facts, he may learn much by observation, but he will not get the actual experience necessary. We may in this way make friends abroad, to help us with capital, knowledge, and materials. This may lead to partnerships and associations beneficial to both the parties. This, in short, is what Commerce can do for us.

Communications.

The consideration of Commerce naturally leads to the consideration of facilities for communications and transport. In our own country the Post and Telegraph offices, both run by Government, are excellent institutions, and the rates of charges are within our means. They are fairly well extended and are extending, keeping pace with the growing needs of the people. The only drawback in them is that Indians have only the subordinate handling of the machinery. The Railways, which also help much in personal communication, are fairly extensive, and means for further and much more rapid expansion, I am sure, will be found if a wiser and more careful and more sympathetic policy is

followed. Roads there are, but still a great need exists for more roads both in British India and Native States. This subject, I am afraid, does not receive the same attention now that it once used to do. Public Works Road Branch, was primarily intended to build roads for purposes other than Commerce; but now that the trade of the country, both for internal and external supply is progressing, a new impetus should be given to road making, and the Commercial Department of the Government of India, if it does not do anything else for us might do this much and lay down a programme of road building. Means of carting stuff from place to place, from the Mundi to the Station, and from the station to the Bazar are very crude and dilatorious. Here, again, is an opening for the ingenious and the enterprising to invent cheap means for handling this traffic.

Auxiliary Factors.

59. Auxiliaries to trade are storing places, in towns and market places, and storing accommodations at Railways and Sea Ports; as also packing materials and packing facilities. The subjects are simple enough but proper scientific care is not being taken of these matters.

60. Beyond the limits of one's country, one has to look to the shipping facilities, the docks, and the handling of cargoes. Foreign commercial customs, practices and laws have also to be studied.

As these factors have not yet entered into our reckoning I will not take up your time with an elaboration of ideas about these matters; but in the internal economy of business there is one very important factor, which requires more than a passing allusion, at our hands.

Railway Ownership.

61. (a) Railway is said to be the largest industry of the country. So it is. It employs over 16 thousand Europeans and Anglo-Indians and those who pass under those names, and over half a million of Indians. It covers the whole country, and its track is now 33 thousand miles of open lines. On its proprietary side it is

a Government monopoly, with the exception of a few hundred miles which also will, in time, fall into Government hands. It is a paying concern, and therefore the monopolist policy is, so far, justified. But the rates of fares and freights are also Government or contractors' monopoly, and if the Government had chosen Railways could have always paid in the past and will always pay in the future. There is no science about Indian Railway fares and freights, and very little competition.

Managements.

(b) The working of the Railways, both State and others, is shared by the Government and some private English Companies; very little management being in Indian hands. This is a policy open to much objection and works adversely to Indian trade interests. Private English concerns are not bound by the same moral duties towards Indians as the State is. This tells both in the way of keeping out Indians out of places of honour, responsibility and profit; and also in regulating traffic rates-

Capital.

(c) Very little Indian Capital has so far found its way to Indian Railways. Some people assert that this is so because the policy of the Government has not been favourable, and my own well-considered opinion on the subject fully endorses that view. While Government borrows at $3\frac{1}{2}$ per cent; Port Trust, Municipalities and Improvement Trusts get funds at 4 per cent; the Post Office has received several crores of rupees at an interest about 3 per cent; and the Bank Deposits in India range from 3 to 6 per cent maximum, according to the standing of the Banks; the question naturally arises why do not the Railways attract Indian Capital when their earnings amount to 6 per cent and over, with a guarantee, rebates up to 5 per cent and with a clause of repurchase at 125 per cent. The truth is, that the portals of the Railway Board Offices are not open for free admission of Indians, and the policy, whatever its worth on paper, is highly exclusive and restrictive. It is also a fact that the Indian Capitalist does not know that Railways can also be financed by him; and there are no organizations for helping popular investments in Indian Railways.

Stores etc.

(d) Construction and administration of Railways require stores, supplies, vehicles and other goods worth millions every year. The policy, hitherto followed, has not been in any way to encourage home productions; and it is one department where the general opinion, held by the powers that be, is that Indians can neither manage; nor construct; nor manufacture railway requirements; nor can they run Indian trains; nor drive Engines, or guard the travellers. This is, therefore, no doubt the largest industry in the country, but not the largest Indian industry.

Traffic.

(e) The traffic branch of the Indian Railways is in many cases run against the interest of the country's manufacturers; but as this subject is now a commonplace knowledge of the people, it need not detain us long; but this is not all that can be urged against handling of traffic by Indian Railways. Everybody now complains of the shortness of waggons, of a preferential and differential treatment in the supply of waggons, and of the practice of allowing rebates and regulating freights. There is the further complaint that there is no time limit to the transport of goods, 5 days, 15 days, and 25 days are taken on the same journey for the same class of goods.

What is Required.

If India is ever to become a manufacturing country, this system or rather the want of a system in handling traffic by Indian Railways will have to be entirely changed. Some of the curiosities of the Indian Railway traffic are most amusing. Any one who has got anything to do with our Railways could cite a number of them from his own experience. I will mention only two. One is that my goods which go a shorter distance pay a higher freight, than the goods of my competitors, which have not only to go a longer distance, but which actually pass in front of my factory, and are booked for the same destination as mine. I had once upon a time to send Cotton from Punjab to Bombay, and then get it at Surat, because the combined freight was cheaper than the direct freight from Punjab to Surat. What is therefore wanted

is a Traffic Board, consisting of Indian and European Members to regulate the traffic rates.

Labour.

(f) Indirectly the railways, as pointed out above, have a great formative influence on the tone of other Industries. Hence this largest industry of India, requires to enforce greater economy in the employment of labour, at all stages of administration, and to improve the morale of its employees. I am not alluding to this fact, as the result of any pique but the tone of labour is deteriorating in all its phases in the country, because the Railways pay the best, and expect the least work, and employ the least efficient. There are men to spare, in all walks of Railway services, and these must be spared, to the lasting good of Railways themselves and other industries.

(g) The Railways already form a monopoly; but if the Government will make it a National monopoly, great things may come out of it in India. Let Indians be gradually, at least, introduced to high places of its administration, and Indian ideas and suggestions be invited to make it a National concern. It is the largest Industry no doubt, but the people have paid the smallest attention to it so far.

General Observations.

62. The field of economic enquiry is very extensive and I am afraid I have already tired your patience, but I must briefly refer to what two of my predecessors have said about our social readjustments. I will go further and say that the conception of an "economic man" in western economics has been very limited. He was at one time depicted as a man bent on making profits anyhow. He had the good wishes of his Government with him, and the blessings of his country were showered over his head. He was depicted as a man stern and determined, with hardly any heart and feelings. Ideas have now changed and the modern "economic man" of the West, is depicted with a kindly face indicating benevolent intentions.

Now let us picture an Oriental and especially an Indian 'economic' man. I fear you will have to place the following in

some order or other in the picture to realise what he really should be :

1. His ragged dress, marked "no capital".
2. Satuka ata.
3. His Mahurats.
4. Sea Voyage injunctions.
5. His wife and children.
6. Cares of dissolution of partnership.
7. Division of parental property.
8. Government.
9. Railways.
10. Bad labour.
11. Bad tools.
12. And lastly no economic ambition no but longing for *Nirvana*.

Now please try to imagine the picture of our 'economic man' and then consider the innumerable number of adjustments that will be required to idealise our picture of an 'economic man'.

63. Now the problem before us is to improve and idealise the above picture. We want pictures to paint this picture, and Senior Wranglers to wrangle out this problem of idealisation. While we want publicists to push the economic ideas, we want leaders to work manufactures and commerce; we also want thinkers and students. There is a rich field for thought and enquiry. This picture has many more elements than the Western picture has and therefore it requires a much larger elaboration. Some of the Chapters of a treatise in this new science will comprise :

1. Economic view of Religion as taught by prophets and reformers and as practised by the people.

2. Economic view of Social laws, practices, customs and ideas.

3. New conception of State duty.

4. New ideas about labour.

5. New theories about Railways.

I am indeed glad that the members of the National Council of Education, Bengal, are taking up Economic subjects for study and enquiry, and I was particularly pleased with reading a book on Indian Economics from the pen of one of them.

Conclusion.

64. After considering the whole range of the subject in *as short a space of time as possible*, the conclusions at which I have arrived, are these. We must, however, always keep in mind that in business the line of least resistance is always the safest and the surest course to follow :

1. That for one generation at least the ambition of our educated young men should be to adopt a business career, in preference to an official, educational or professional and that parents should endeavour to give them an outfit qualifying them for this career in preference to any other ; and that the marriages of the young men, to be dedicated to business, should be postponed even beyond the Vedic limit of 25 years. And where this may not be possible the marriage vow should directly and distinctly indicate that the woman whom he weds, would be prepared to go to the other end of the world and roam all over without complaint or grievance ; and that investment in her husband's business, or in the business to which he is attached, would be her best jewel and ornament.

2. That the Government, aristocrats, chiefs and the people should at once, and without loss of time, provide the country with Business and Commercial Colleges, where a knowledge of business machinery, organisation, and efficiency and a knowledge of modern languages should be imparted.

3. That chairs of Indian Economics and Agriculture be founded in connection with all the existing and projected Universities.

4. That Economic Science be studied by all our public men ; and by the rising youths of the country with special reference to Indian problems. The study will help in making many lasting reputations, and will afford a rich field for building up a new Science of Oriental economics or the economic science of the weak.

5. That the country be studded with Chambers of Commerce, walking in the footsteps of similar institutions now existing and which have existed in European countries ; whose one function amongst others should be to find a business career for honest, capable, and willing educated Indian youths.

6. That special associations, such as cotton spinners and weavers, cotton dealers ; of Bankers and of Insurance Companies ; be started at central places, to look into the interests of their special concerns.

7. That Banking, Insurance and Foreign commerce should form our first concern.

8. That Government should throw open to Indians half the top appointments, in all its Technical departments, namely, Railways, Telegraph and Post Offices, Forests, Surveys, Geological and Metrological Departments, Irrigation, Electrical and Mechanical Workshops, Electric Supplies, and Civil Engineering.

9. That special and sufficient provision be made in all Local Councils and in the Imperial to have Commercial and Industrial representation.

10. That the commercial departments of the Government of India should see to the needs of Indians as well to those of Europeans ; and that they should back Indian those efforts as often as of outsiders.

11. That Native States should help the movement of economic regeneration, as they represent $\frac{1}{3}$ of the whole of India ; and that means should be found to have their co-operation with the Government, and the people of British India, instead of their making isolated efforts.

12. European Manufacturers, Bankers, Insurers, Exporters, Importers and Transporters should advance Indians beyond the position of clerks, and entrust them with duties requiring intelligence, responsibility and capacity.

13. That Swadeshism be taken at its word, and be organised principally in the channel of capital.

14. That Banking and Insurance Institutions be pushed, and should be domesticated.

15. That Boards for Technical education be inaugurated, and they should endeavour to grapple, with the assistance of public and subscribed funds, to raise the standard of efficiency of labour and to secure greater economy in all handicrafts, and factory industries.

16. That public press should give more attention and space to economic questions rather than to general news, political discussions, racial bickerings and individual panegyrics.

17. That the Industrial Conference should have an annual allotment of Rs. 25,000 in place of Rs. 5,000 and should employ more numerous staff, one to every department of Agriculture, Commerce, Industries, Mining, Co-operation and the like; and these men should travel to organise, educate and, if necessary, to agitate.

18. But above all what we want is peace, peace unbroken both from outside and from within.

Last Word.

65. I cannot but conclude this Address, with the words of my old master, Professor Alfred Marshall of Cambridge, whose enthusiasm for Economics, both Theoretical and Practical inspired me with my present career. He said to me, "Do what you like in life, but do not give up Economics" and I have tried to act up to that advice.

Professor Marshall, whose words apply equally to our present condition as they did to Cambridge a quarter of a century back, says :—

“Such then is the work that lies before economics science : let us consider the relation in which Cambridge stands to it. There is wanted a wider and more scientific knowledge of fact ; an organ stronger and more complete, more able to analyse and help in the solution of the economic problems of the age. To develop and apply the organ on rightly is our most urgent need : and this requires all the faculties of a trained scientific mind. Eloquence and erudition have been lavishly spent in the service of Economics. They are good in their way ; but what is most wanted now is the power of keeping the head cool and clear in tracing and analysing the combined action of many combined causes. Exceptional genius being left out of account, this power is rarely found save among those who have gone through a severe course of work in the more advanced sciences. Cambridge has more such men than any other university in the world. But alas, few of them turn to the task.

“For indeed the work is urgent. Material wealth has ever had but slight charms for the Academic mind. Our best men both young and old have found their joy in doing the best work of which they are capable, and have cared but little whether its money gain would be great or small. Secure themselves of being able to live a refined and cultured, and with a just and noble scorn of those who hunt after superfluous riches, they have often drifted into an attitude of philosophic indifference to wealth and all its concerns. But this has been a great and disastrous mistake.

“For why are so many lives dragged on through dirt and squalor and misery ? Why are there so many haggard faces and stunted minds ? Chiefly because there is not wealth enough ; and what there is, not well distributed, and well used. Much has been said of the physical suffering and ill-health caused by overcrowded dwellings, but the mental and moral ill-health due to them are greater evils still. With better house-room and better food, with less hard work and more leisure, the great mass of our people would have the power of leading a life quite unlike that which they must lead now, a life far higher and far more noble.

“ It has often been observed that one cause of the marvellous achievements of the Greeks was the directness with which they addressed themselves to the problems of their own time. Never was there an age full of great social problems as ours; surely they are not unworthy of the best efforts of the best minds among us. Think of the force that University men might bring to bear by their personal influence, if great numbers of them had learnt to think clearly and had studied the age in which they live. They might then take a wise, an active part in relieving misery without making pauperism; in helping the people to educate themselves and rise to a higher level; to become not only more efficient producers but also wiser consumers, with greater knowledge and greater love of all that is beautiful.

“ And, lastly, if more University men looked upon their life here as preparing them for the higher posts of business, what a change there would be in the tone of business! Just and noble sentiments might be introduced into counting-house and factory and workshop, without the dangers which weak benevolence runs of turning sentiment into sentimentality, of courting ruin and increasing the common prejudice that a pleasant looking house of business is likely to be financially unsound.

“ It will be my most cherished ambition, my highest endeavour to do what with my poor ability and my limited strength I may, to increase the numbers of those, whom Cambridge, the great mother of strong men, sends out in the world with cool heads but warm hearts, willing to give some at least of their best powers to grappling with the social suffering around them; resolved not to rest content till they have done what in them lies to discover how far it is possible to open up to all the material means of a refined and noble life.”

The Annual Report.

The President :—The Hon'ble Mr. R. N. Mudholkar will present the usual Annual Report on the working of the Conference during the year.

The Hon'ble Rao Bahadur R. N. Mudholkar :—Mr President, ladies and gentlemen, it is a part of the duties of

the General Secretary to lay before you the Report of the working of the Industrial Conference and at the same time to submit along with it a record of the general industrial activity during the last twelve months, *viz*: the activity of the Imperial Government, of the Provincial Governments, of the Native States and of the people. The Report is printed and I believe copies of the same have been distributed; if not, they will be distributed presently. I shall not at this hour read the long report which has been printed and which is to be published and placed before the country. I shall only draw your attention to a few facts contained in my own report. The first thing I have to draw your attention to, is that last year at this Conference a resolution was passed for the purpose of making enquiries into the causes of the numerous failures of industrial enterprises in the different parts of the country, and I was commissioned to employ competent persons for going about and making enquiries in those parts to find out whether it was on account of anything wrong in ourselves, or anything wrong in the methods of our administration or anything in the surroundings which brought about these unfortunate results. It is a matter of great regret to me, that it was not possible for me to do anything in the least in this direction. for the very simple reason that our appeal for funds was not responded to even to the extent to which it had been in former years. Gentlemen, it is an unpleasant duty which lies on me to point out that persons who occupy very high positions in the Industrial Conference and persons who occupy very high positions in the country, persons whom God has blessed with the good things of the earth, have not seen their duty to the country in the matter of the development of its industries and commerce. Appeals were sent to them over and over again; but I had to wait for months and months and absolutely no response was made to them. And it is owing to this reason that the task laid on me by the Conference was not carried out. The usual work of the Conference, namely, that of bringing out the report and a fresh edition of the Directory of Indian goods and Industries has been carried out and materials for certain other compilations which will be placed before the country are being collected. But the great

work of organising committees in the different provinces, or rather, reviving the committees which some years ago were established but which after a year's or in some cases of only six months' existence went to sleep—that task has not been carried out, because the funds necessary for this purpose were not supplied to me. Another important thing, namely, the establishment of a bureau of information—that also could not be carried out for the same reason. This year another appeal will be made to you ; but in reference to it, the inability of your Secretary to do all the things he wished and the things which he was commissioned to do, has to be placed before you and I trust this fact will receive the consideration it deserves from the people.

In regard to the general activities in the country, it is a matter of great pleasure to me that the Imperial Government and the Provincial Governments are taking the same interest—I may even say in some matters greater interest than has been evinced by them for some years past. In Bombay, the enquiries which had been instituted in regard to hand-loom weaving and leather manufacture are now being supplemented by an enquiry in regard to the oil industry namely the expression and refinement of oils and their bearing on the different industries which flow therefrom. In regard to paper-making and other industries also, experts are being employed by the Government to make enquiries and to submit reports. All that has been done in these matters, you will find stated here.

Our own people have in this respect not been quite quiescent, though the activity is not what it was seven or eight years ago. The enthusiasm of that period has gone away, but there is one act, one great thing done by one individual to whom the thanks of the whole country are due, that I would like to mention to you and that is the splendid, the most munificent and most generous gift of Sir T. Palit, (Cheers.) to the Calcutta University, for the promotion of Science, theoretical and applied. There have been also gifts made on the Bombay side and much humbler work done in other parts

of the country. You will find mention of them made in this Report and as the programme appears to be a long one, I will content myself with making these observations and laying this Report before the President and before you.

The President:—Gentlemen, the Report that has been presented by the Secretary is full of facts and he has made an introductory speech with regard to its being adopted. I do not think any further discussion is required in regard to it.

The Report was unanimously adopted.

Papers contributed.

The President:—Gentlemen, now, we will proceed to the reading of a few of the papers that have been received. I call upon Mr. Mohiuddeen Sahib to read his paper on the Co-operative movement.

Mr. Mohiuddeen Sahib:—Ladies and gentlemen, I may tell you at the outset, that I am a public servant and my duties are to supervise and propagate the co-operative movement in the Provinces of Behar and Orissa. During my wanderings I was very much struck with one thing, that is, the absolute ignorance and apathy of the educated people towards this movement. I confine my remarks only to these provinces, because, from what I have read in the different reports, I find that in Bombay and Madras the people have come forward voluntarily and heartily to assist the Government and they have shown so much co-operation in the movement that Government have now very little to do. In Bombay, the munificent philanthropist, Sir Vithaldas Thackersey has started a big Bank which propagates and supports this movement. I know that in this Province also, the educated people have only to know what immense potentialities there are for this movement for raising the economic condition of the people, and this hope is my excuse for proposing to read a short paper on Co-operative Societies before you.

The President next called upon Rao Saheb Ganesh Nagesh Sahasrabuddhe, and Prof. J. N. Samaddar to read their papers which are reproduced elsewhere.

The Hon'ble Rao Bahadur R. N. Mudholkar :—Gentlemen, I shall now only read the names of the gentlemen and the names of the papers which have been received by us in addition to those of which the purport has been given to you by the authors. There are in all you will be glad to learn, 24 or 25 such papers, some of them of great merit ; especially the paper of that keen industrialist who is in Government service and who is superintending the work of Commercial Intelligence, I mean Mr. Noel Paton; it is almost a literary treat; and I am sorry it is not possible for me to read even extracts of it, as at one time I proposed to do, because, there is a lot of other work to be done. It tells us what different works are being done in different parts of the country and how in spite of all that they say in conservative India, great transformation is going on and how different trades are handled and what progress has been made. It talks of Burma, Central India, of Northern India, busy Bombay, Southern India, Mysore and Travancore. I am sorry, as I said, that I can't read that most readable paper to you. Another paper is in regard to cotton manufacture by Mr. H. R. Pitke. Third paper is on " Sugar-cane cultivation " by Babu Mukhtar Singh, Pleader, Meerut ; another paper on " Agricultural Associations in the Deccan " by Mr. V. K. Kogekar ; the fifth is on the " Preservation of National Art, handicrafts and character " by Dr. R. V. Khedkar, Kolhapur. The sixth is on cotton cultivation by Babu Mukhtar Singh, the same gentleman who has written on sugar-cane cultivation ; the seventh " small industries and scope for their development in India " has already been summarised to you by my friend Mr. Ganesh Nagesh Sahasrabuddhe. The eighth " The industrial Exhibition and sale of work of the Salvation Army in Bombay ", is a plea for cottage industries by Mr. Trimbak Ramchandra Kotwal. It is a thing which will give great pleasure to my

friend Mr. Ganesh Nagesh. The ninth is "Unlimited Liability as a National asset" by Mr. H. R. Crosthwaite, Registrar of the Co-operative Societies, Central Provinces and Berar. This again gives to us in a very convenient form all the advantages and benefits which the co-operative movement is likely to confer upon us. The tenth is "Banking in India" by Mr. C. Gopal Menon, Madras, who also wrote about Co-operative Societies in former years; the eleventh, "prospects of sugar industry in India" by Mr. G. N. Sahasrabuddhe; the twelfth "technically trained students" by Professor V. G. Kale, who has written practically a note criticising the report of Lt. Col. Atkinson and Mr. Dawson in regard to the technical enquiry entrusted to them by Government. You will hear more about that report in the course of this day. The thirteenth is "the Possibilities of a revival of hand printed and painted cottons of South India" by Mr. W. S. Hadaway, Superintendent, School of Arts, Madras. That again is a thing in regard to the handloom industry and textile manufactures. The fourteenth is "the Development of industries in Travancore" by Dr. Kunjan Pillai, the fifteenth, "the History of the Brass and Copper Industries of India" by Professor P. G. Shah. It is a very readable paper. It is very long and is full of information which extends over 60 pages of closely printed type. It gives you an immense amount of information. The sixteenth "Causes of general failure of oil pressing industry in Bombay Presidency" by Mr. Kapilaram Vakil, is a paper in regard to which an antidote will probably be administered to you by our friend the Hon'ble Mr. Parekh. The seventeenth, "the Law of trade-mark in British India", by Mr. S. Krishnamachari, Madras—deals with the legal aspects of the question. The eighteenth is "Silk in India" by Mr. M. N. De. He is an authority on the subject, and is the Sericultural Assistant to the Imperial Entomologist, Pusa. The nineteenth is "the place of domestic industry in Indian economic life" by Professor R. K. Mookerji. The twentieth, "the Importance of Manual instruction in Indian Schools" by a gentleman who is entitled to speak with authority on educational matters, Mr. H. J. Bhabha,

retired Inspector General of Education, Mysore State, at one time my teacher, when I was a boy in college. That gentleman tells about the great importance of training not only the head or even the eye as drawing enables you to do, but also the hand which is as essential for all cultured men as the training of the brain. It is a very readable paper. The twenty-first is "Co-operative Village Libraries" of which Professor Jogindranath Samaddar has just given us an interesting summary. The twenty-second is "the Study of economics in India" by Professor Russel of your college here who is rightly considered as an authority on Indian Economics. The twenty-third, "the Patna College, Chanakya Society by members of the Society" many of whom are to-day serving as volunteers and thereby rendering very good account of themselves; the twenty-fourth "how to develop the Glass-making as a cottage industry in India" by Babu Panna Lal, Amballa.

These are the papers. Copies of them will be given to such gentlemen as really care to study these questions and afterwards, as you know, they will be embodied in the report of the Conference. As I said I am very sorry that even the purport of these papers cannot be given for want of time. But I assure you that most of them will repay not only a mere perusal but deep and conscientious study. I only ask with the President's permission to put one thing before you, that is, to tender our sincerest acknowledgments and our thanks to the gifted and eminent writers of these various papers and to convey to them our gratitude (Cheers).

All these papers will be found reproduced elsewhere.

The First Resolution.

Outrage on the Viceroy.

The President:—Now we proceed to the consideration of the Resolutions. The first resolution is in these terms.

"The Indian Industrial Conference expresses its indignation and abhorrence at the dastardly outrage committed upon the

life of His Excellency the Viceroy and begs to offer its respectful sympathies to Their Excellencies, Lord and Lady Hardinge and the Conference fervently prays that His Excellency will have a speedy recovery and restoration to health."

The resolution was put to the vote and carried unanimously.

Second Resolution.

Chairs for Agriculture and Commerce.

The Hon'ble Mr. Rao Bahadur R. N. Mudholkar in proposing the Resolution said :—

Gentlemen, I have the honour to propose the resolution which stands in my name. I shall first read it to you :—

" In view of the great importance of properly developing agriculture and Indian Commerce, this Conference urges upon Government and the people the urgent necessity of establishing Chairs of Agriculture and Commerce for spreading knowledge of the general principles of these subjects among persons who do not wish to specialise in them ; and for the suitable advancement of Technical Education, the Conference strongly advocates the creation of Boards constituted on lines similar to the Senates of Universities for directing and regulating instruction therein."

You will see that the proposition falls under two main heads. One of the main heads is itself subdivided into two sub-heads. Gentlemen, we are called "the Indian Industrial Conference". But, here the term Industrial is used in its most comprehensive sense as including agriculture also. We have been talking a great deal and striving to no small extent for the advancement of what may be called the manufacturing industries as differentiated from the agricultural industry. But one thing we have to remember is this, that INDIA is and must continue to be essentially an agricultural country. Agriculture is and must continue to be the staple industry of the country. More than two-thirds of the population are directly connected with the cultivation of the soil and another 25 o/o more is indirectly connected with it. So the importance

of agriculture in India does not require any demonstration. Now it is this industry which has to be developed for the simple reason that by the law of diminishing returns, not in the sense in which economists use the word, but in the sense in which physicists use it—by the law of diminishing returns our agricultural industry is not as productive and as advantageous as it used to be in former times. Compare the produce of our Indian fields with what you find in colder climates, in BOHEMIA, in BAVARIA, in ENGLAND and in CANADA. We do not get from one acre even half or even one-third of what they get in CANADA or BAVARIA. The average yield per acre is only about 800 or 900 bushels, at the most. Generally it can be said to be about 600 bushels, whereas in the countries of the North and the West it is as large as 1800 and at times even more. From the AIN-I-AKABARI you find that the yield in those times was 1200 to 1600 bushels per acre. Evidently something wrong is at work there; and in regard to that various things have been suggested and various things have been done. Now in regard to agriculture itself there are two things which you have to bear in mind. In those lands where the proprietorship of land is vested in large Zamindars, where there are huge estates which have got the benefit of the permanent settlement, it is very necessary that the recommendation made in this resolution should be carried out. The person who directly tills the lands, is the person in whom expert knowledge, so far as the actual cultivation is required, ought to be instilled, and ought to be made general. Over and above that you have got the proprietors and the various tenure holders. They are all interested in their estates and unless they have a general knowledge of the principles of agriculture, they cannot take that intelligent interest in the development of their estates which alone can bring about the agricultural regeneration of India. I suppose, I may say I hope, that it is not necessary for me to press this point much further. It is only to be recognised in our parts of the country, and I am sure it is recognised in this part of the country also, that what you require is not the man who knows the details of the actual

cultivation, but the man who has got a sufficient grasp of the principles of agriculture, who knows also the economic and the commercial side of it, who also can take large views. It is that kind of knowledge, information and instruction which is to be imparted to persons who are in the higher rungs of the ladder; and for this purpose this resolution suggests that there should be chairs of agriculture established in the first place in the Universities—and I believe that will have to be carried down below—for the purpose of giving this kind of general instruction in the principles of agriculture.

We come next to the question of commerce, which is of still greater importance. My friend Rao Saheb GANESH NAGESH depicted to you the various failures which large industries have suffered. I am in agreement with him in regard to these occurrences and nobody is more sorry than myself for these unfortunate failures. I am also in very great sympathy with what he says in regard to the starting of cottage industries; but like practical men we have to recognise hard facts. There are certain industries which alone can be carried out with any chance of success for any length of time by manual operation at our homes. There are others which, we must recognise, have to be carried on on a large scale to be remunerative, and which unless large capital is organised and large establishments are employed and the working carried on on a grand scale, will never at all be profitable and will never yield any advantage to the country or to their conductors. I myself am absolutely no lover of the factory system, it is common knowledge that in too many instances the system kills humanity towards the poor operatives. But there are many hard things of this world, which we have to recognise and one of them is that you cannot carry on many industries except on a very large scale. Both for these large industries and the small industries one essential is required, *viz.*, a knowledge of the general principles of economics. Without that the whole system is insecure as if based on a foundation of sand. The collapse of so many factories and so many industries was due to want of knowledge, want of experience, implicit trust in persons, who do

not themselves know anything, in some instances in persons, who to ignorance added some qualities which I do not like to mention. This want of sufficient capital, want of knowledge as to the best way of doing things and as to the best market to be and various other causes have brought about the downfall of these particular industries. To prevent the unfortunate recurrences of these failures and to see that they do not produce the disappointment which they are bound to produce, there is great need of a more intimate knowledge of commerce and commercial principles, the machinery of business, the methods of banking, the way in which operations on a large scale are carried on in other parts of the country and how the commerce of the world itself is carried on—all these things ought to be made much more familiar than they are at present. Without that kind of knowledge, none of your industries, none of the efforts, which you are making either individually or in numbers can succeed. It is, therefore, of the utmost importance that this knowledge should be obtained not only by those who carry on these operations, not only by the managers of the business, I mean persons entrusted with the actual work in the office, but also by others who are not directly connected with that business.

Then I come to the other thing. Our president agreeing with his predecessors, pointed out to you how along, with capital, skill is also required and that skill can only come from technical education. Now in regard to technical education this proposition has become necessary, as I said, after the very disappointing report of the Committee from which we expected a good many results. I am sorry I cannot go into the whole history of the question, which I gave to my friends yesterday. But I for one should have thought that practical suggestions for imparting a higher form of technical education would be put forward by persons of the knowledge and experience of Lieut. Col. Atkinson and Mr. Dawson of Bombay. However, those suggestions are not there. One thing which we have to recognise is this, that it is only by the knowledge and skill, not mere bookish knowledge, not merely knowledge

acquired in factories,—it is by a combination of theory, that is, knowledge of principles with practical training acquired in the factories—it is only by these things that your industries can progress and for that you require suitable technical education. The technical education which we want, therefore, is one which the directors, the organisers of industries, the managers and the supervisors ought to have; and for this it is necessary to have the matter entrusted (—at present there is nobody who can control it)—to Boards who will constitute what we may call the Senate in regard to technical education. The persons who control *viz*: the Directors of Public Instruction know absolutely nothing of technical education. I can say this without the least fear of being called mistaken. We know that not one of them knows anything about technical education. The Government of India do not profess to be persons who know anything of technical education. It is a fortunate thing that the member in charge of the department of education is a gentleman who takes very keen interest in technical education. But he does not profess at all to be any authority on the subject of industries. The Senates of the Universities, except in a few cases, have no members who can lay down what are the proper courses to be adopted for technical education. In these circumstances, it is absolutely necessary that if the proper kind of technical education is to be imparted to our people and if India is to have industries of her own conducted in a proper manner and successfully, it is absolutely necessary that we must have the proper kind of technical education and we cannot have that unless we have Boards or if you like the word “Senates” of technical education and it is on that ground that this resolution is framed.

With these words, gentlemen, I commend the proposition to your acceptance.

Hon'ble Rai Bahadur Krishna Sahay in seconding the Resolution said :—**Mr. Chairman and gentlemen,** After the able and lucid exposition of the subject-matter of this resolution by our veteran leader, the Hon'ble Mr. Mudholkar, there remains very little for me to say to commend this resolution to you. Gentlemen, India is a poor agricultural country and the vast millions of her people depend on agriculture. They follow it as the avocation of their lives. You and I who belong to the profession will not fail to fall back upon it if at any time, necessity will compel us to do so. Therefore, the question of the development of agriculture is a question of vital importance in India unlike in other countries. Look at the sad state of affairs as it exists at the present day. You have people employing the same implements of agriculture, which they did centuries or thousands of years ago. They use the same manure which their forefathers did. In fact you see in agriculture everything which should have existed in ante-diluvian time. If you look round you, you do not observe any progress. The question naturally occurs to you, "What is this due to?" "What are the causes and how can they be removed in order to ameliorate the condition of agriculturists and with them our condition too?" I assure you that much of it is due to want of knowledge of the science of agriculture. It is proposed, therefore, to urge upon the Government the necessity of establishing chairs for the instruction in and imparting of the knowledge of the general principles of agriculture throughout the length and breadth of the country. Now Government have done a great deal in this direction as we all know. They have established Colleges of agriculture and model agricultural farms. For instance, we have here at some distance from this place, a college for research in agriculture and we have also in the district of Bhagalpu a college where students receive elementary education in agriculture. These two institutions are no doubt opening up avenues for the people who undergo instruction in agriculture. But they are more or less, particularly the institution in Pusa, intended for persons who want to specialize. What the resolution urges upon the Government is the desirability of

founding chairs to impart instruction in the general principles of agriculture and also of commerce. As regards commerce little need be said. We all know the importance of commerce in the development of the resources of the country. Many of you are familiar with the Sanskrit saying "Lakshmi" lives in Commerce and half the profits can also be realised from agriculture. Even a cursory glance at the condition of the various flourishing countries of the world will conclusively prove to you the force of this ancient saying. Commerce has made England what it is in the present day and what it is likely to be in the future. Japan, a modern country has improved its condition by commerce only. It is needless therefore to emphasise this point at great length *viz.*, what an important part in development of the natural resources of the country commerce plays, what I have said as regards agriculture applies to commerce also and with greater force. It is, therefore, suggested in this resolution that Government ought to be moved to found chairs to impart general instruction in Commerce. I do not know any important institution in this part of the country for a purpose like this. There are institutions to give instruction in commerce but what their possibilities are, one can have no general idea. But there are institutions in other parts of the country, where they give instruction in commerce but the means provided for imparting this instruction in commerce are not adequate or at any rate are inadequate to meet the growing ambition of the people to have some knowledge of commerce. It is a desideratum and the sooner it is met the better for the people as well as for the Government which is doing so much for us. Gentlemen, our Government is a benign one and I am sure that we have only to draw its attention in a systematic manner in order to enable us to have the Chairs referred to in the Resolution which has been so ably proposed by Rao Bahadur Mudholkar. We must be knocking at the gate, if we want to have its portals opened out to us. These are the things which we must have and the sooner the better. Therefore, gentlemen, we should urge upon the Government the desirability of instituting Chairs for commerce and also for agriculture.

With these words, I commend the resolution to your acceptance (Cheers).

(The resolution was put to the vote and carried unanimously.)

Third Resolution.

Indian Chambers of Commerce.

Mr. L. V. Kaikini proposed the Resolution in the following words :—

The Resolution which I am asked to propose runs as follows :—

“ This Conference draw the attention of the Commercial and other business classes.

- (a) To the great necessity of establishing Indian Chambers of Commerce and Associations of the Industrial and Financial interests, wherever circumstances exist and,
- (b) To the importance to themselves and to the country of their engaging to a greater extent than hitherto, in the foreign trade of the country.”

Gentlemen—this resolution calls upon our business classes to organise and systematize their commercial activities, because I suppose it is a great lesson, which I trust our country, at great cost has, at last learned that. be it social reform or industry or any other sphere of activity, without organisation and discipline nothing can be achieved. If our countrymen are lacking in any of the qualities more especially than in all the others it is these two qualities; therefore, the Industrial Conference has rendered a public service by putting before you this important resolution for your acceptance. We know we have made a small beginning in the way of starting Indian Chambers of Commerce and similar Associations. In Bombay, we have an Indian Merchants' Bureau and a Chamber of Commerce which have been doing good work in watching over the interests of the Indian merchants in that province and generally of the commerce of the country. In Calcutta, we have the Bengal National Chamber of Commerce and also the Marwari Chamber of Commerce.

Besides, in Bombay we have got a Grain Merchants' Association and a Millowners' Association and several other associations with regard to the different industries. These institutions, although they are few are happy instances and point to the one great fact that our Indian merchants are realising gradually the need and the importance of these associations for the protection of their vast and varied interests in the commerce of the country. Therefore this resolution does nothing more than call upon the business classes to start more business associations and more business societies, wherever suitable circumstances exist for their progress. This modifying clause need not be interpreted as providing a loophole to those merchants who want to escape the responsibility which this resolution places upon them. Circumstances there may be of any kind; but if our people have the will and the stimulating desire they can create favourable circumstances for themselves. This is an important lesson which ought to be borne in mind in the consideration of this question. If you look at the European organisations for the promotion of commerce and the protection of their commercial interests, we can realise what infinite importance is attached to them. Unless we decide to watch our needs in the same effective manner not only by way of starting these associations and chambers of commerce, but also by giving them such hearty support as will bring them prestige and power in the councils of the Government and also knowledge in the commerce of the country generally; unless and until we do so, I do not suppose we shall have done our duty by the country to which we belong. Until we do that, I do not think our economic welfare will come soon. In fact it may stand in danger of forever remaining an illusion.

Now, the second part of the resolution exhorts our countrymen to engage to a greater extent than hitherto in the foreign trade of the country. Our President in his admirable address has told us what an important factor the foreign trade, the seaborne trade of the country constitutes in the economic life of the people. Look at the huge figure of £ 260,000,000 the total

value of the imports and exports. When we look at that huge figure and when we also remember the fact that in the huge transactions represented by that figure, our people from the beginning to the end have hardly any share—they are nowhere in this transaction—when we see this we can realise the miserable situation in which the commercial condition of the country is placed. Therefore this resolution calls upon you to engage to a greater extent than hitherto in the foreign trade of the country. There is one point which this resolution may bring forward in greater prominence and that is, if you look at European countries, they spend a lot on maintaining their foreign trade consuls even in the remotest corners of the globe, to report the situation, to guard their interests there and also to find out openings for their youngmen to exploit countries for their own benefit and not for the benefit of the countries which produce the raw materials. When we look at these activities of European commercial life I think we ought to direct our energies more to this important question. With these few words I commend the proposition to your acceptance

Dr. S. V. Ketkar in seconding the resolution said :—
Mr. Chairman and gentlemen, this resolution draws attention to two things, first of all “ to the great necessity of establishing Indian Chambers of Commerce and Associations of the Industrial and Financial interests wherever suitable circumstances exist ; ” and secondly “ to the importance to themselves and to the country of their engaging to a greater extent than hitherto in the foreign trade of the country ”. A question would naturally be asked, what in the world is the connection between these two items proposed in the resolution ? But there is a great deal of connection between them. A great principle is underlying it, because the first is a preparation for the second. If you are better united, if all these financial resources of the country are better organised and if you have a desire to exploit foreign trade, then the first thing, that is, proper organisation in the country itself would be a great help for us to exploit the foreign trade. There are a great number of

things which can be done if people unite; and at present they have not done that. India does not possess the same opportunities for expanding her commerce and exploiting foreign countries as other independent countries possess. We do not have a consular service, other countries have consular services. These different Associations, these Chambers of Commerce and Boards should unite together and establish their representatives in the different countries to establish the Indian trade abroad. We understand that among the British Colonies and Dependencies, Canada is trying to establish its own consular service. South Africa and New Zealand are also trying to establish their legations in England. If anybody walks through Charing Cross, the central part of London, he will find these representatives of the different Governments sitting there to establish and promote their trade in England and through England all over the world; for at present London is the centre of the world's commerce. If the Government undertake to do such work, well and good. If they do not, it is our duty to do it. We can unite and undertake this work. This is not a new thing. In ancient India also we had some such associations. There were different trade guilds. These guilds were federated together under City guilds and these different City guilds used to send representatives to other countries to extend their commerce. The principle is ancient and it is an Indian principle and there is an opportunity for extending it more and more. The political effects of united commercial undertakings would be great. If People would learn to unite and work together in business centres and give practical effect to their ideas they would impress the public mind more and more. Therefore with these words I support the resolution heartily.

The resolution was put to the vote and carried unanimously.

The Fourth Resolution.

The Recent Enquiry in regard to Technical Education.

Mr. N. A. Dravid :—Mr. President, the resolution that I have to move is connected with the committee appointed by the Government “ to enquire into the wants of the employers of labour for technically trained men and to bring technical institutions into closer touch and more practical relations with the employers of labour in India ”. We have got the Report here and the resolution that I have to move is in relation to that. The resolution runs thus :—

“ This Conference expresses its disappointment at the recommendations made by Lieutenant-Colonel Atkinson and Mr. Dawson in regard to higher Technical Education and expresses its disagreement with the recommendation in regard to the State Technical Scholarships, as these recommendations are not calculated to secure that higher type of knowledge of principles and practice required for organisation, direction, and management of industries.”

In the able address of our President which we just now heard, he has summarised or extracted from that report the twelve recommendations made by this Committee. You will find from a perusal of these recommendations that they are disappointing. The fault is not in those who went about enquiring into the question. Though the recommendations made within the sphere assigned to them, are quite adequate for that purpose, still the question has to be approached, to be useful to the country, from a larger point of view. This the commissioners or enquirers have not been able to do on account of the scope of their enquiry being limited. On page 3 you will find that the “ inception organization or improvement of industries ” is excluded from the scope of the enquiry. In the number of papers that have been read before you just now, there is one by Prof. Kale and in that he has summarised the contents of this Report and offered his comments on the same. I will invite your attention to that paper if you want to go carefully into this question, but I will give you two extracts out of

the many which have been quoted there. With regard to some of the points referred to him, the Hon'ble Sir Gangadhar Rao Chitnavis, whose name must be familiar to you all, says: "The points referred to me do not cover the whole ground of technical instruction, the true object of which, in my humble opinion, is and should be, in the present state of the industrial and commercial development of the country, not so much the supply of existing demands as to attract Indian talent to commerce and industry. The production of skilled servants is, after all only a subordinate question". And again our General Secretary has remarked "without minimising the importance of creating a class of trained" and educated operatives, it has been stated that the most important factors in "the increased production of national wealth would in the case of Indians at least at present, be the leaders, the managers, directors and supervisors of industries. It is the skill, capacity and training of generals and captains "which determine victories more than the bravery and steadiness of the rank and file of an army." With regard to the whole of this Report there is one initial observation which has to be made and it is this:—They have approached the whole question from a very narrow point of view. The Indians who agitate for larger technical institutions and more thorough technical training do not want that we should have more skilled operatives in the lower ranks of the industrial organisation. What they want is that many industries that exist now and that are yet to be established should be handled by the Indians. That is the question and it is analogous to that which has been agitating this country for many years with regard to the public service. The same question is being agitated there. In the subordinate and the provincial ranks we have Indians; in the higher ranks of the service the Indian element is excluded. In the industries of the Country also the same system prevails; and what we want is not that the country should immediately have more skilled operatives,—though it is not a mean thing to be aimed at—but the agitation started by the Indian publicists is not for filling up the lower ranks in the Industrial organisation; but that the Indians

should be trained for the higher services in the Industrial organisation ; and that is exactly the point of view which this Committee seems to have avoided and from that point of view their recommendations cover very limited ground and are very unsatisfactory. Of the many recommendations that the Committee has made, we have singled out one, namely, the suggestion they have made that the Technical Scholarships which the Government of India have been giving for some time past should be curtailed, if not actually abolished. They say " We recommend that students should not be sent to England ".

Our protest is particularly against this recommendation made by the Committee. We have singled out this recommendation alone because of its importance. It reveals to you the whole character of the recommendations they have made. All the recommendations the Committee has made are tainted with the preliminary idea, the Committee seems to have started with, namely, the consideration of the existing avenues of employment that are available to Indians. There are many avenues which could be opened up, if properly trained Indians could come back from abroad provided with the required technical skill. And from that point of view, it is not at all desirable that these scholarships should be abolished at this stage. If the Committee had said that over and above these technical scholarships that are given in the case of those who are to be the pioneers and the directors of Industries, smaller technical scholarships should be given to those, who are in the lower rungs of the ladder of industrial organisation, we would have had no complaint against the recommendation they have made. But the general spirit, animating this enquiry is not what ought to have prompted them ; and I will again repeat to you what Sir Gangadhar Rao Chitnavis has said, " The true object of it in my humble opinion, is and should be, in the present state of the " industrial and commercial development of the country, not so much the supply of existing demands as to attract Indian talents to commerce and industry." We have also to foresee the demands that are to arise in the

future and we have to train our young men as industrialists to occupy the higher rungs of the ladder. The case of industrial organisation is somewhat different from the case of the public service. In the case of the public service, all the employments being in the hands of the Government, we can bring pressure to bear on them to open up the higher posts for Indians. In the case of industries, it is all private capital that is invested. In all these matters, if you do not train Indian industrialists to occupy these positions, the avenues which they can have after providing for their own men would be very limited. There are a large number of these, which if only Government would take care could be opened up. I mean the Railway Service. Higher employments in railways are not open to Indians, and it is to my mind that avenue where we can train Indian industrialists and technical men. Our railways have now become the monopoly of the state and Indians do not get more than the lower subordinate posts. If a proper lift could be given to the Indian element, in course of time these men that would join the Railway service, will later on be the pioneers of many other industries. We have seen many instances of retired Lieutenant Governors becoming directors of companies and industries. We have seen Executive Engineers after retirement from service promoting big companies. We know one such instance in Bombay. Mr. Godbole who is a retired Ex. Engineer has started a railway. You must look to this. If Indian technical instruction is to succeed in opening various avenues for employment, it is from that point of view that the recommendations made by the Committee are very inadequate and are all directed to the question how under the present conditions the demands of employers of labour who are mostly Europeans except on the Bombay side should be met. From that point of view these recommendations have been made. From that point of view, it is not the higher operatives, not the Director, manager or Superior officer of the Industrial army that are required, it is only the lower kind of operative. But we have to bear larger interests of the situation in mind. With these words I commend this proposition to your acceptance.

Mr. M. B. Sant in seconding the Resolution said:—Mr. President, brother-delegates and gentlemen, the proposition which has been entrusted to me has been ably dealt with by my predecessor and only very few observations are required from me. I must obey the orders of the President and shall say a few words. I must express my complete disappointment at the result that has been achieved by the Committee. It appears that the Committee started with some preconceived notions and instead of satisfying the country's requirements in regard to technical education, they have come to a disheartening conclusion. Instead of promoting technical education they have distinctly made an attempt to discourage it; and not only that but the State scholarships which have been awarded by Government from year to year have been discountenanced. It is, therefore, our duty to express our emphatic protest against the action that has been taken by the Committee. With these few observations, I entrust the resolution to your care and I hope it will be carried with acclamation.

The proposition was put to the vote and carried unanimously.

Eleventh Resolution.

Department of Industries in the Provinces.

The President:—Resolution No. 11 will be taken before the rest.

The Hon'ble Mr. Gokuldas K. Parekh in moving the Resolution said:—Mr. President and gentlemen, the resolution that has been put into my hands runs as follows:—

“ This Conference once more urges that :

- (a) There should be in every province of British India, a Department of Industry under a Director of Industries to deal with purely industrial questions and to be in charge of Technical, Commercial as well as Industrial Education in the Province; and that there should be an advisory board of qualified persons not less than one half of whom

should be non-official Indians, who should be consulted on economic questions of importance, that the functions of this department should include (1) the introduction of new or improved methods and processes, (2) the carrying out of investigation and experiments, (3) the development of selected industries, (4) the organisation of Industrial and Commercial Exhibitions.

- (5) That there should be an Industrial Museum and bureau of information under the Department of Industry for supply of information and advice to the public on all Industrial and Commercial matters within the Province."

You will see that many of the rigid essentials for all industries will be at hand, if enterprise be at hand. What are the other essentials for the success of industries? This resolution mentions one of the conditions that are essential, that is, that the Government should establish a department of industries and that there should be a Board consisting of a large proportion of Indians for the purpose of advising the Government in connection with those industries. The first portion of the work of the department which we recommend is to give advice in regard to the introduction of new and improved methods and processes. The industries that we propose and we think we can succeed in introducing into our country are those which have been partially introduced and are prevailing in many other countries. In civilised countries the methods of carrying out these industries alter and improve from day to day. The world has gone on improving. In foreign countries improvements are proceeding from day to day. There would be no use of our remaining where we are while others are making progress. It is necessary that there should be bureaus of information for improvements of existing industries and the introduction of new processes in connection with those industries. If we do not introduce them, we cannot thrive and would be kept back in the race of competition. The other thing that is needed is the carrying out of investigation and experiments in most of these industries, which we wish to introduce in this country and which we wish should succeed. One great difficulty is that if you find there is some wrong process, something which requires improvement

there is no man to advise. There are no laboratories and there are no facilities for making experiments. Laboratories should therefore be established and we should be able to ascertain where the defects are by obtaining proper advice and to see the way in which improvements can be made; and therefore industries which depend for their success on chemical and other scientific knowledge cannot be carried on unless we have laboratories and experts making experiments who can advise us from time to time and solve our difficulties.

The other thing that is wanted is the development of selected industries. There are a number of industries. Some of them it would be useless to attempt, being too small or not worth attempting and therefore the best thing is to find out the most suitable industries for advancement and to bestow all our energy and resources on the development of those particular industries. Therefore it is quite necessary that this department should be able to select a few industries.

The last thing is the organization of the Industrial and Commercial Exhibitions. You are aware, gentlemen, that exhibitions play a great part in advancing the industries of other countries. You find patterns and the ways of work and a number of new goods, and if you have Exhibitions the people who go to them will be able to see in what way they can make improvements in their own business. Therefore I think the resolution is a very important one and if the department is established, great progress will be made in industries and I recommend that this proposition be accepted.

Babu Ram Gopal Chowdry said, as follows in seconding the Resolution :—Mr. President and Gentlemen, I happen to belong to a community whose vocation is pure agriculture—the community of landlords. Now, gentlemen, I add my testimony to that of the proposer. Without industry and commerce our country will not be able to support itself for a long time. Whenever there is failure of rain in a single season, we know to what state the country is reduced though it is a fact that a sufficient

amount of food for the maintenance of the country is produced in the land. In countries where no corn is grown, they maintain themselves easily and there is no fear of scarcity or famine there. Then how is it that in India, though we have got so much agriculture and a sufficient amount of produce even in seasons when the rains fail, so many people die of starvation? The thing is we have taken to agriculture alone and simple agriculture cannot support the people. It is therefore essential that we should take not only to agriculture but to commerce and industries as soon as possible. We should also ask the Government to start industries and establish a department of industries in every Province. Of course, His Excellency Lord Curzon opened a new Department of Industries, but that is for Imperial trade. We want a department of industry in every Province of the country. Unless and until that is done, nothing can be achieved. We have got Agricultural Colleges at Sabour and at Cawnpore and we have got the Imperial Institute at Pusa, but they are more agricultural than industrial and commercial. Therefore it is necessary that the Government should take the matter into its own hands and see that every province has an independent department of industry. Let us press on the Government, and press with all the force that we can command that a separate department of industries should be established in the different provinces. With these words I second the resolution.

The resolution was put to the vote and carried unanimously.

The Fifth Resolution.

Polytechnic College.

The Hon'ble Babu Dwarakanath proposed the fifth resolution which was as follows and in doing so made a very eloquent speech in Hindi:—

“While expressing its appreciation and thankfulness to the Government for the liberal action taken and contemplated, in

regard to Technical education, this conference once more records its firm conviction that for placing the cause of industrial progress on a firm basis, it is most necessary that the Government should establish in the country at least one fully-equipped Polytechnic College for imparting the highest kind of instruction in the applied sciences and industries."

Mr. M. S. Sinha seconded the resolution in Hindi. The resolution was put to the vote and carried unanimously.

Sixth Resolution.

Technical Education.

Moulvi Muhammad Hussain Sahib in proposing the Resolution said:—Mr. President and Gentlemen, The resolution which I have been called upon to propose is one which materially concerns the welfare of India. It cannot be gain-said that this is a matter upon which to a great extent the future of the country depends. The resolution which I have been called upon to propose is as follows :—

"This conference urges all Provincial Governments and administrations, Rulers of Indian States, as well as Principals and Superintendents of Private or Aided Schools and Colleges, to add Commercial, Technical and Industrial classes for instruction in commercial subjects as well as in weaving, dyeing, sheet-metal working, smithy, carpentry etc., to the existing courses of instruction, wherever practicable to afford facilities to boys of all communities to learn useful industries as a means of their livelihood."

This is a resolution which ought to be heartily supported. Gentlemen, you are well aware of what other countries have done and what they are doing on the strength of their industrial institutions. Industry is a matter in which India is lagging far behind other countries. And it is a matter which with proper agitation will, we are sure, receive the cordial support of the Government and of the Native States.

Mr. C. B. Sahay:—Mr. President and Gentlemen, The resolution which has been so ably moved by my friend Moulvi M. Hussain does not require many words from me to commend it to your acceptance. Technical education is a most pressing need of the country. We have been passing resolution after resolution every year and we have also been doing something in that direction, but not in this part of the country. Bombay is still leading the way. The people there have started Technical schools and they have also started Mills, so that by giving education to their boys they give them also the means of livelihood. But in our part of the country, supposing the boys do not take to industrial education, I do not know what their fate will be. I have myself seen a graduate in Engineering begging from door to door for anything that we could give him. He could not even earn his livelihood. His degree could not get him that. Therefore it is time that we should ask the Government to give facilities for Technical training and I ask our Chiefs here and the Maharajahs to start factories and mills and give facilities to students to specialise in some subjects. I shall take one subject only, the subject of agriculture. India is an agricultural country. Seventy-five per cent of the population live on agriculture. We are tilling the soil in the way in which our fore fathers did. We are sowing in the same way that they did. We use the same manure as they did. The soil is over-burdened and does not yield what it did a few years ago. We have got an agricultural school in Sabour, but students from this part of the country do not attend it in large numbers. And why?—because they see no prospect before them. There is no prospect for them when they come back after passing through their course there. There are no experimental farms. Not as single Raja or Maharajah is going to place a thousand acres or farms to work upon and the gentlemen who go there for education not only lose their health but contract debts also. I do not believe in always asking the Government for this thing or that thing. I believe more in our own efforts. We must make self-sacrifices and if we can stand on our own legs the Government will help us to advance further.

This Resolution includes smithy carpentry, and other small works. We have not got technical colleges or schools and it is impossible for us to have instruction in these subjects in an Arts School. Even if the Principal wants to do it, he is powerless. But we can open small workshops, ordinary smithies and carpentry works in every village if only our people wake up. Weaving had been a flourishing art in our part of the country and is now dying. Thousands of families are still going on with handlooms in the province of Behar. From this platform, I appeal to the Government and to the people to start handloom weaving factories in Behar, where there are thousands of people weaving their own coarse cloths, who, if they are properly trained and provided with capital will, I am sure, turn out better material also. It was our privilege in the middle ages to decorate drawing halls of England and other places with tapestries from Agra. What is our condition now? It is just the reverse. If we go to any decent drawing room, we find that every article there has been imported from Japan, England or Germany. Why has it come to this? Because we have not been able to give technical education and to produce men here, who can give their time to the weaving industry. We have been able to produce in India the best orators and the finest Judges; but still our country has not given birth even to one man who can stand comparison with some of the catpains of industry in England and other countries we are certainly not lacking in that capacity, as Bengal has been sending students every year to other countries—America, Germany and England who have turned out graduates equal to the best foreign graduates. The only thing which we require is stimulus and it has not been given to us. I again appeal from this platform to the Government not only to start schools and colleges, but at the same time I ask you, gentlemen, to decide to form associations for the advancement of scientific, and technical education as they have done in Bengal and as they are doing in other parts of the country. In Behar we have failed. We tried once but we have not done anything. Why?—because the people here do more talking than practical work.

I appeal to my Behar brethren here to take up the cause of technical education in right earnest and try to advance once more, and to revive the Industrial associations which they had formed a few years ago and to send out students to foreign countries, as well as to give them scholarships to study in the Colleges here, in Bombay, Poona and other places. With these few words I commend the resolution to your acceptance.

Mr. Kane :—Mr. President and gentlemen, the resolution that has been put before you contains two things : first of all to give Technical education, Commercial education and Industrial education to your children in schools. When you have established Technical Colleges, you must have small children educated in small arts. Unless you teach weaving in some small measure, unless you teach dyeing in small measure, unless you teach tailoring, carpentry or smithy in some small measure to the children, when they are beginning to learn their A.B.C. till they have completed their elementary education, you will not be able to send them to the Colleges. There in America education is given with two objects, to make the children good citizens and to make them able to earn their livelihood. But in India education is more literary than practical. All people who become B. As. will not be able to get Government service. Therefore you must give boys and girls such education as will enable them to earn their livelihood. If you teach a small child of 10 years how to use carpenter's tools or smith's tools or to dye papers that you have seen here in this hall or to dye small cloths that are prepared and put up here, you will teach them how to earn their livelihood. The object of education must be to teach children to become good citizens able to earn their livelihood. Jewish children were taught two professions and they live well in the world, because if one profession failed they could take to the other. This ought to be the object of education. Industrial education means education to carry on technical industries. Technical education means education to work on raw materials, and commercial education means the knowledge of the art of buying and selling with profit to the

buyer or the seller. Our Emperor has told us to educate, to unite, and then to hope. When you have learnt small industries and are able to earn your food, then only you will be able to unite together and if you are able to unite together by education, then you can hope to make this country a great and glorious one (cheers).

Mr. Harkare :—Gentlemen, The resolution which I am called upon to support is the one that has already been read to you by the proposer and the seconder, so the only thing I have to say in respect of it is this : we have already numerous technical schools in India and we have only to revive them. Yesterday in the All India Hindu Religious Conference we passed a resolution on education, an omnibus resolution on education, generally, which includes technical education as well. It should be given by an expert and not by a layman. He must be an expert in the trade he teaches and must follow the profession he teaches. You have to take also the help of the religious forces in India. That will revive this sort of technical education. With these few words I commend this resolution to your acceptance.

The resolution was put to the vote and carried.

Seventh Resolution.

Failure of Industrial Enterprises.

Professor Jadunath Sarcar:—Mr. President and gentlemen, the resolution that has been entrusted to me runs as follows:—

“This Conference notes with regret and concern the failure of several industrial enterprises started for carrying on new industries and the effect these failures have produced in damping the ardour of the people in the development of the resources of

the country. The Conference calls upon the leaders of the people in the different Provinces and Districts to institute inquiries into the causes of these failures and to communicate to the General Secretary the results of their inquiries, and authorises the General Secretary to depute one or more persons for conducting this investigation, if the funds, at his disposal, permit."

It is an unfortunate fact that according to the calculations made about 26 years ago 75 o/o of the Joint Stock companies started in India had failed. This is to be greatly deplored, first because ours is a poor country, probably the poorest that has received modern education; and secondly we have started very recently on an industrial career on modern lines and we cannot therefore afford to lose our capital nor could we afford to be discouraged. An enquiry into the circumstances that have led to the failure of so many industrial concerns recently started in India is supremely necessary for the education of the investors. Unless the investor is properly educated, he will be shy to invest in future. Secondly, if we do not point out the mistakes of our predecessors, we shall not be able to follow the right path. The resolution, therefore, will commend itself to all reasonable men. Some people run away with the conclusion that our people are more dishonest than other nations; for they urge there would not otherwise have been so many failures. But as a matter of fact there have been failures of Industrial concerns in other countries too. Particularly in Europe every commercial boom is followed by a crisis. As I told you at the beginning, we cannot afford to lose even a portion of our capital which European countries lose when periodical commercial booms are followed by commercial crisis. Our people are not more dishonest individually than the people of other countries. Possibly as commercialism is a new growth in our land, collective morality is not so advanced here as in other countries. That is to say, certain virtues which are at the root of commercial success such as punctuality, method of organisation and so on are wanting among us. I look to time to cure these evils. Another set of people urge that our people have an inherent incapacity for conducting industries. We have only

to look to the success of several industries in different provinces of India to conclude that this assertion is not true. Incapacity may be due to absence of technical knowledge for which a remedy has also been proposed. It may be due to lack of business habits. But this evil will certainly be cured, if you proceed from small industries to large ones. It is the man who has succeeded in one thing that can succeed in another. Thirdly, it may be due to laziness in studying the situation of commercial problems in all their bearings and this I will briefly touch afterwards.

Education of the investors is supremely necessary. The proposal which is made by me just now, urges upon the leaders in the various provinces to institute enquiries and place the result of those enquiries at the disposal of the public. Secondly, it empowers the General Secretary of the Industrial Conference to depute people to make inquiries on the spot into the actual circumstances that have led to the failure of the local industries and afterwards to publish the results of the local investigations. The method of enquiry to my mind should be on the following lines. First, whether the home training of the people encourages habits of punctuality, order and the love of keeping everything in its proper place. For instance, we generally have the habit of mixing up our home affairs and our business concerns. That ought to be carefully avoided. Secondly, so far as I can judge, we do not attach so much importance to account-keeping and periodical auditing as every European firm, even the poorest, does. We sometimes follow a penny-wise and pound-foolish policy of putting off the duty of stock-taking. We should not think that we lose sales on the days on which we have to do our stock-taking. Account books should be strictly maintained and periodical auditing and stock-taking should be insisted on once in six months or at least once a year. A cheeseparing policy should be avoided. Our investors will be able to see where they stand. Thirdly, full publicity should be given to the result of the stock-taking. If that is not done, there may be reason to suspect fraud. Fourthly, as soon

as a new project is started it is the duty of the press to critically examine it with the aid of experts. As soon as an industrial undertaking is started, as usual the papers set up a chorus of applause in the sacred name of Swadeshi. The result is that an immature project fails and it discourages people from investing public capital on such businesses. Therefore, superior knowledge on the part of the people especially the leaders of the people will lead to the elimination of unsuitable projects in the beginning. The process to be followed should be carefully examined, the distance of the factory from the place of origin of the raw materials should be carefully examined and the existence of possible competitors in the locality should be taken into consideration. If the company fails after these things have been considered, then there must be a different cause.

Again the enquirers ought to consider whether the projectors have followed the principle that the direction of industries requires special ability and great physical activity. It cannot be left entirely in the hands of people, who have retired from Government service on the ground of superannuation; nor can it be left in the hands of busy lawyers, patriotic men no doubt, but who cannot devote enough time to such projects. Industries must be directed by people, who make it their sole concern. Lastly, we ought to consider whether the standard of commercial morality has been sufficiently reached. In England, the Right Hon'ble Sir John Dillon, had to put a stop to his political career, because the firm of which he was a member failed through the dishonesty of one of its subordinates, though his personal integrity was never called into question. A similar fate overtook Lord Dufferin towards the end of his long and prosperous career. We ought to see that a similar rigid standard of commercial morality is insisted on. If a public man, who acts as a director of a company does not personally look after it, and the company fails, that ought to put a stop to his public career in future. These, to my mind, ought to be the lines on which the enquiry should be conducted. But when I propose this investigation

I do it not in a spirit of despondency in regard to the future of the country, but because by an observation of the mistakes of our predecessors, we shall see where they stumbled, so that we shall be able to learn to walk erect. Nations no less than individuals may rise on the step stones of their dead selves to higher things. (Cheers.) The knowledge which this investigation will place before you will enable you to avoid the pitfalls which have ruined our predecessors. I therefore commend this resolution to your favourable consideration. (Cheers.)

Mr. Ram Narayan Prasad :—I have been asked to second the resolution. You have read the report of the General Secretary and from that you learn that there were several failures and that he proposed to start an enquiry as to the cause of these failures, but for want of funds he was unable to carry out this business which was entrusted to him. Now in this resolution also we find in the last portion that the enquiry is entrusted to our leaders in the Provinces, but the Secretary will also have to depute one or more persons for conducting these investigations, if the funds at his disposal will permit. Now, gentlemen, for making these enquires it is absolutely necessary to depute men, and unless the Secretary will have funds in his hands, it will be rather difficult for him to carry out this work. And unless the causes of the failures are ascertained and made public, you cannot avoid similar failures in the future with regard to new companies. So it is absolutely necessary to find out those faults on account of which the companies have failed and lay these causes before the public, so that the future companies and projects may not share the same fate. With these remarks, I second the proposition that it is absolutely necessary that such an enquiry ought to be made.

Mr. K. P. Sen Sinha :— Mr. President and gentlemen, it is with mixed feelings that I rise to support this resolution. Just now you have heard the very able speech of Professor Jadunath Sarcar on this subject, and it is quite superfluous for me to say anything regarding the causes of these failures. Yet I

would attempt to make a few observations on this subject. The first cause which appears to my mind is want of skilled and educated labour. The labourers are ignorant ; the labourers have got very bad habits ; they are addicted to drunkenness. They do not know how to spend the money they earn and that is one of the reasons why these industries have so often failed. Then there is lack of discipline and character. The third reason is the want of business capacity in those gentlemen, who started these Mills and other concerns. Here I would pause for a moment and make a reference to the Mill started in Bengal. When Swadeshi enthusiasm was running high, our Bengali friends started several Mills in their Province, but all these Mills failed, only because that enthusiasm was short-lived. They wanted to make Swadeshi a political not an economic weapon but let me assure you that if Mills are started based on lines laid down by those great Indian economists, Mr. Mahadev Govind Ranade and Mr. Telang, I think these mills are bound to succeed. The chief obstacle to India's industrial development is the divorce between brain and muscle. Then there is lack of teachers and genuine students. Here you have got Industrial Colleges—very few in number indeed, but even in these Industrial Colleges it is a matter of very great shame that Indian teachers are practically very few, I should say almost none. European teachers no doubt who have come to India give lessons to Indian students on these subjects, but they suffer from the disadvantage of ignorance of the vernaculars. The European teachers who come here can give lessons to the students in English, but many of the Indian students especially the labourers and the masses, cannot follow what they say. Before I finish I must appeal to your sentiment. The Swadeshi spirit which ran so high in Bengal ought to be kept up also. 'Swadeshi' a certain gentleman said, 'was bound to be a failure.' Why ? Because Swadeshi was not carried on in a proper spirit, in a business-like way. The Swadeshi movement ought also to be preserved ; because it is necessary for the success of these industries, that you should be patriotic and should suffer certain losses and purchase goods.

produced in your own country even at a sacrifice. But for the masses you cannot appeal to them in the name of patriotism, because they are yet ignorant and know very little of patriotism. Therefore, the essential things required for the industrial development of the country are, mass education, production of cheap goods and also production of teachers in this country. Gentlemen, I do not like to detain you any further. The appeal has gone and I hope all of you who have come here will make it a point to try for the industrial development of your country as there can be no political regeneration without industrial development. (Cheers.)

The resolution was put to the vote and carried unanimously.

Rai Purnendu Narayan Sinha :—For the convenience of the delegates I would propose that all the remaining resolutions be put from the chair.

The President : There are certain resolutions which could be put from the chair. Let us take them first.

Eighth Resolution.

Handloom Weaving.

The President:—I will first take resolution No. 8 which is as follows :—

“ This Conference specially invites the attention of the capitalists to the great and urgent necessity of improving the existing condition of the weaving industry by the introduction of labour—saving hand-looms and other devices of approved patterns, in important centres of the Hand-loom weaving industry, with the co-operation of the weaving classes.”

No speeches are required. You understand the resolution and if you approve of it, hold up your hands.

The resolution was unanimously carried.

Ninth Resolution.

Railway Rates.

The President :—The next is resolution No. 9.

“ This Conference once more calls the attention of the Government to the prevailing complaints about the anomalous character of the existing Railway rates on goods and their prejudicial effect on interprovincial trade and urges the necessity of laying down for interprovincial consignments the same scales of rates as those for consignments to and from important ports.”

The resolution was unanimously carried.

Tenth Resolution.

Faculty of Commerce.

The President :—The next resolution is as regards the Faculty of Commerce.

“ This Conference records its sense of gratitude to the Government of Bombay for having created a Faculty of Commerce and urges the Local Governments and the other Universities in India to follow the example of the Bombay University in establishing Faculties of commerce for giving an impetus to Commercial Education.”

This is also a simple resolution, if you approve of it, please raise your hands.

The resolution was unanimously carried.

Twelfth Resolution.

Co-operative Banks.

Rai Purnendu Narayan Sinha :—The resolution which I have to move runs as follows :—

“ This Conference once more welcomes the establishment in the Bombay Presidency of a Central Co-operative Bank and urges upon the Government and the people of other Provinces the need of establishing similar Banks to help the existing Co-operative Credit Societies for advancing loans at reasonable rates and on easy terms to the agriculturists.”

I think that there is no movement calculated so much to improve the economic condition of the people than co-operation. I believe more in co-operation than in protection. Whether I am right or wrong, before we have protection, we must seek co-operation. Co-operative Credit Societies affect our rural classes also and to some extent our small industries. Those who have anything to do with these Co-operative Credit Societies know how difficult it is to get Central Banks to finance them. My friend Mr. Mo-hi-uddin Sahib, personal assistant to the Registrar of Co-operative Societies who read the paper on these Societies did not give his experience on this point, but I know we feel great difficulty in finding a Bank to finance those Credit Societies which have been started. We had correspondence with the Bank of Bengal for a year but without success. We have not succeeded with the Benares Bank to get loans at an interest of 8 %. That will serve the purposes of Behar for the time being. It is a practical difficulty and the Central Co-operative Credit Bank of Bombay is just the thing, which we want in all the Provinces. This resolution refers to the most important measure for the economic progress of our land and I commend it to your acceptance.

Mr. L. V. Kaikini:—The Central Co-operative Bank of the Province represents the source from which we have to tap the capital which is absolutely necessary for improving the lot of the village agriculturists and cultivators. It is something like a channel. The Presidency Bank lends money to the Central Bank and the Central Bank lends them out to the village banks at interest and they lend out money to individual members. Thus the money reaches the individual ryots and the cultivators. In this resolution, reference is made to the

Provincial Bank started in Bombay, but I may add that a Provincial Bank also has been started in the Central, Provinces in Nagpur to promote Co-operation in that Province. Therefore it is absolutely necessary that in every Province where co-operation has made some progress, an institution on these lines with necessary alterations according to local conditions, should be started. With these words, I second the resolution.

Mr. Panday Narayan Singh :—As the time is getting on I am not going to inflict a speech on you. What I want to bring home to your minds is that, if you will consider the subject thoroughly, you will understand the difficulties that arise in places where there are no Co-operative Societies. And if the Co-operative Societies are to be useful you must have a Central Bank whence you may get good help. You know the rural societies depend entirely, or rather largely, on the Central Society. From the latest figures it appears that less than half of the working capital is advanced by the Government; the remaining half is derived from such sources as share-holders, depositors or other persons who pay to these Societies. Therefore from this it appears that Central Banks are important and unless you start a Central Bank in all the different important places, I do not think these Rural Societies will do any substantial good. With these few words, I commend the resolution.

The resolution was put to the vote and carried.

Fourteenth Resolution.

Co-operative Credit Societies.

Mr. G. K. Devadhar :—Mr. President, Ladies and Gentlemen. The resolution that is entrusted to my care reads thus :—

This Conference expresses its great satisfaction at the progress which Co-operative Credit has made in this country since the passing of the Co-operative Credit Societies' Act of

1904, and earnestly hopes that with the wider application of the principle of Co-operation under the Co-operative Societies' Act of 1912, Government will give larger financial and administrative facilities which are needed to secure a surer growth of Co-operation and exhorts the educated public to strenuously extend its operations to various branches of agriculture and small industries which are bound to prosper with the help of the movement of Co-operation.

Gentlemen, as it is getting very late, I must be very brief and therefore I shall touch only on a few points which have been embodied in this resolution for your favourable consideration. Those of you who are acquainted with the economic forces that are more or less revolutionising the social and industrial conditions of most of the western countries will bear me out when I say that Co-operation, this large movement of co-operation, has proved a great building factor. Speaking from the economic and the moral, social and other points of view, it has really been the resurrection of India during the last eight years, since the passing of the Co-operative Credit Societies' Act of 1904. We too have great reason to be proud that it has worked a very substantial progress in the direction of energising some of our agricultural classes. You all know that this movement was originally started by Lord Curzon by the passing of that Act, though feeble attempts were made in the direction long before that. During these 8 years we have now above 8177 Societies. I have taken these figures from the recent reports that have been issued by the Conference which met at Simla last October. And the membership of these Societies is 430,000. I believe the capital which has been disbursed by these Co-operative Credit Societies exceeds three crores of Rupees. It is 3,075,00,000 out of which only 9 lakhs have come from the Government and the total disbursements amount to Rs. 443,00,000. You will be glad to know that a couple of years ago the number of Societies was half. By the end of last year it came to something like 6,000 and during the last year, more than 2 thousand societies have been added. The membership has

been doubled, the amount of capital available for the various industries and specially for agricultural co-operation has also been nearly doubled. If this rate of progress is kept up, surely during the next few years, we shall easily have ten thousand societies. Now what I want principally to lay stress on is that this principle of co-operation is recognised by the existing Act which not only makes it possible to have Co-operative Credit Societies ; but the operation of the principle of co-operation is to be extended and the Government are prepared to register Societies that come into existence not only for the sake of credit but also for other purposes, such as, agriculture, commerce and industries which could be built upon co-operation. And for this, an Act has been passed this year and it is very necessary for us to take advantage of the principle and the facilities of the Act and extend co-operation in the various branches of Industrial and Economic activities. The third point, with which I have to deal is that Government ought to give us larger financial and administrative facilities. Those of you who are conversant with the progress and advance which these Societies are making in the various Provinces will easily recognise that the Department of the Co-operative Registrar is not so fully and efficiently manned as it ought to be, to keep pace with the growth of this movement. I do not know the experience in Behar, but I am sure in the Central Provinces, the Registrar of Co-operative Credit Societies, Mr. Crosthwaite is not able to register more Societies because, he says his staff is not able to supervise the work of auditing the accounts. Similarly, in Bombay and so also in Madras. In this connection, I had to read a paper before the Bombay Provincial Conference emphasising the necessity for further State-aid in the matter of the development of Co-operation. Then also we want to have financial assistance. Our friend who moved the last proposition has told you how the Registrar found it difficult to get the necessary capital for the Societies, and therefore, unless you have a Central Bank, the Government should give some money to these small Societies. But whatever interest the Government might show, and what-

ever assistance the Government might give, the movement cannot surely make any headway worth the name, unless the educated people recognize that it is their duty and responsibility to help the institution. But it is really a very sad feature of the history of this movement that the educated classes in the country have not really shown as much interest and earnestness with regard to its progress and development as they ought to; and those of you who are sincerely earnest about the all-side growth of the masses of the people cannot do better than to interest your selves in co-operative work and if you can study the great, and marvellous results which this Co-operative movement has achieved in Western countries, I am sure you will recognize that it is the most patriotic, national and sacred work that you can be called upon to do in the name of your country. (Cheers.) I must say that this will be largely useful to agriculture. There is a book which has been recently published this year by Mr. Woulf, who is a high authority on agriculture called "Co-operation in Agriculture", and if you have time kindly go through that book and you will see what great changes have been effected in agriculture in other countries. In fact in a country like Denmark, there is no person who is not a member of a Co-operative Credit Society and there are some, who are members of nine or ten Co-operative Credit Societies, because the principle of Co-operation has made easy the development of the agricultural industry. Similarly you can speak of small industries also. In one country, Germany, by means of the movement of Co-operation, by means of 25,000 or 26,000 Co-operative institutions, more than six hundred crores of rupees are made to fructify and run into the channels of industrial and agricultural improvement. If you, therefore, see the great potentiality of this movement in advancing the economic industrial and agricultural interests of our country, and more especially in increasing the administrative capacity of the people, I believe you will lend your support, and make up your mind to interest yourselves in this movement, read its literature, understand the principle and engage yourself in the work and contribute to the success of this movement. When

the next Industrial Conference is held, I hope there will be more societies started with the assistance and the real co-operation of the educated classes in all the Provinces. With these words, I commend this proposition to your enthusiastic acceptance.

Mr. R. V. Mahajani :—Mr. President and gentlemen, I will be very brief in my remarks and in making those remarks I will try to give you some experience from my own Province. I come from Berar and the Central Provinces; and the number of Credit Societies which have been registered so far is nearly 839 and the Registrar, as already pointed out by my friend, Mr. Devadhar refuses to register certain societies because he has not got a sufficiently large number of assistants. I will also give another experience. Although the Act says that there would be free auditing of the accounts of village societies, still in the Central Provinces we find that the number of auditors engaged by the Government is not sufficient to audit the accounts of the Societies that have been already registered; and although the Act says that there should be free auditing, proposals have been made by the Registrar for asking the Central Banks to take a certain loan from the Government, so that there should be a sinking fund and the interest from that fund should be devoted to defray the auditing charges. So I submit that in view of these circumstances, it is necessary for us to ask the Government to be more liberal and to extend the operation of the Act. Then moreover, what I have to submit is that this resolution requires the Government as well as the people to take more interest in the cause of co-operation and it is not only in the cause of co-operative Credit that the work can be done, for under the new Act our work can be extended in other directions also; and an attempt has been already made in several Provinces in that direction. For instance, in Berar an attempt has been made for popularising the cultivation of Russian cotton and also in certain districts of the Central Provinces an attempt is made to popularise a superior variety of wheat seed. To encourage these attempts the Government has recently sanctioned the appointment of an extra Assistant

Commissioner and he is asked to establish unions in several parts of the province. It is necessary that the educated men also should take keen interest; and unless the educated people shake off their indifference and try to take interest in this subject, the work cannot be done by official agency alone. Non-officials and officials must co-operate in this matter and we can only hope for success when there is this co-operation. The results of this co-operation have been already dwelt upon by the previous speakers and also by the gentleman from Behar who gave you the history of co-operation in his Province. For my own Province, I may say that this work is very much liked by the Mahars. Although no special work is done for the depressed classes, work on the lines of the co-operative movement will do a great deal for this class. In Berar the cultivators could get no loans unless they were prepared to pay interest at 2 to 3 % per mensem, now they are able to get them at the rate of 1 per cent. and they are the persons who appreciate the work of the non-officials and the officials. So in view of these circumstances, I urge that the educated classes ought to shake off their indifference and take more real interest in the cause of the co-operative movement. When this interest is taken you can hope for the regeneration of India. With these few remarks, I second the resolution.

The resolution was put to the vote and carried.

Thirteenth Resolution.

Previous Resolutions.

Mr. Mathuranath Sinha :—Mr. President and gentlemen, I have been selected to move this resolution perhaps because I am rather weighty and this resolution which is an omnibus resolution is supposed to require a weighty man to move it. This resolution is a combination of five resolutions and runs as follows :—

“This Conference confirms the resolutions passed in previous years :—

- (1) Calling upon the Government and the people (a) to encourage and help Indian manufactures and (b) to foster and encourage the use of such manufactures ;
- (2) Recommending to the people the desirability of starting Funds for the promotion of Technical and Industrial Education ;
- (3) Inviting the attention of capitalists in India to the urgent need of developing and fully utilising the mineral resources of the country and asking them to make organised efforts in that direction ;
- (4) Urging upon the attention of the Imperial Government the special claim to consideration of the Textile and Sugar Industries ; and praying for the repeal of the excise duty on Cotton goods ;
- 5) Urging the desirability of the standardisation and unification of Weights and Measures so as to remove the serious inconveniences caused to trade by their multiplicity."

Gentlemen, I have only to say one or two words in connection with this. In connection with the last resolution you will find that the name of the Maharajah of Darbhanga is associated with it. You will find in the previous reports that he moved in the matter. There are several inconveniences to trade because there are no standard measures and weights throughout India. For instance, in dealing with cotton, you find that one maund is equal to 40 seers in some places. It is only 30 seers in some places and in other places only 14 seers. So if you go to make a bargain not knowing the actual standard of weight there, all your calculations are likely to be upset. Then with regard to oil, one maund is in some places equal to 34 lbs., in other places it is 31 lbs. The Lieut. Governor of the Punjab, Sir Louis Dane talking on the standardisation of the seer, says that not only will India be benefited by it but trade will be given an impetus as one seer is

the measure of one French kilogramme. This kilogramme is equal to one thousand grammes which Sir Louis Dane says almost comes to the weight of one standard seer. So even foreigners have come to understand that weights and measurements will benefit by a common standard. The Maharajah of Darbhanga suggests that a committee should be formed in order to take some effective steps and to make suggestions as to how this can be carried out. A committee was formed and some suggestions were invited; some of them were favourable and some were not. It is necessary for us to ask the Government to have this resolution carried out in the light of further suggestions so that we might have standard weights and measures.

There are one or two things more. First import duties. We wish that Government should impose import duty on foreign sugar in order to enable the indigenous industry to hold its own. You know that in most of these Provinces sugar industry is carried on to a great extent but it is handicapped by the importation of cheap sugar from foreign countries. If we get some assistance from the Government and some duty is imposed, our industry will succeed better. Then, there is the excise duty—we want to protest against the continuance of this excise duty on cotton goods. Its imposition on cotton-mill-made cloth is unjust and unnecessary and presses heavily on the industries in the Bombay Presidency and we pray that it should be abolished. You know that the Government proposed a tariff of $3\frac{1}{2}$ per cent on certain cotton goods. They did it for the purpose of revenue. Lancashire found in that case their articles would not sell well. There was a big agitation and you know what that agitation means. It is not a paper agitation like ours. It means the turning out of the Ministry,—turning out of the cabinet. So their agitation must be more closely attended to than ours and the result was that the Home Government pressed upon the Indian Government. To the credit of the Indian Government it must be said—you must be grateful to them—that they raised their voice of protest against this mandate from Home and they said that this tariff should be raised here and that they would not listen to Lancashire. But

the Home Government which is more influenced by the feelings of Lancashire than of the people of India sent an official mandate to the Government of India and the Government of India had to obey. We should strengthen the hands of the Government of India and urge again that this unjust impost should be abolished. No amount of vain talk about "free trade" can convince us as to the necessity of having that sort of imposition. Even in France, Germany, Japan, men who have independent self-government do not care for this almost exploded theory of free-trade. A foreign Government which is so powerful and which seeks the happiness, the contentment and the industrial amelioration of the people of this country must see that this sort of thing does not continue.

About the other matters, I need not say anything further. The first resolution speaks for itself. It calls upon the Government and the people to encourage and help Indian manufactures. I think we have been doing this several times at our Industrial Conferences. The whole of the Industrial Conference report is full of it. Our President's appeal is also there and you understand the position. As regards the appeal to the people it has been made to you by several speakers here to open Co-operative Banks and combine together to help indigenous industries by purchasing locally made articles. It is necessary only to add, and perhaps you will all agree with me, in regard to this, there is not a single question of special electorate, no special seal of sanction, no preferential treatment. In the wide and luxuriant vine-yard of the Government, to which every one will be able to have access to pluck luscious fruits, if he will only stretch out his hand. No doubt we must always remember that our roads are not always strewn with roses, sometimes they are strewn with thorns; and, as Professor Jadunath Sircar has told you, sometimes we have to pass through failures but there should not be discouragement. Failures there must be. We have to pick up experience at every step. Even in great European countries, which have achieved so many great things, you do not know what failures

they had to pass through in the past in order to achieve that great success which so bewilders us (Cheers). Gentlemen, we should be prepared of course with fuller knowledge concerning facts. The very fact that you are going to enter the lists will result in minimising the chances of failure.

Mr. Lalit :—I have to speak a few words only in connection with the second clause, which is the only new clause “recommending to the people the desirability of starting funds for the promotion of Technical and Industrial education”. This proposal has for its object the creation of new industries in this country. We all feel a great many difficulties in starting new industries. They are mainly two. The first difficulty is want of expert scientific knowledge and expert workmen, the second is want of money for experimental work. Now for the first difficulty we have funds in the several Provinces. For the other we want funds. We have also recommended, and we have urged on the Government in the second sub-clause of clause A, of the 11th resolution, the carrying out of investigation and experiments; and in resolution V we ask them to establish technical colleges. Now what this clause proposes is that we should not sit silent, because we have asked the Government. We ought to stir ourselves and organize funds. One more thing which I have to say is about the quality of the education to be given. The education should not be given only from the point of view of art but it should be given from the industrial point of view, by which I mean that students should be given opportunities of practising in the factories sufficiently long so that as soon as they leave the factory, they can do practical work and attract capital.

The resolution was put to the vote and carried unanimously.

Fifteenth Resolution.

Sir T. Palit's Endowment.

The President:—The next resolution will be put from the chair. This is a very simple resolution, but a very pleasing one. The resolution is as follows:—

Sir T. Palit's Gift.

“ This Conference places on record its sense of gratitude to Sir T. Palit of Calcutta for his munificent gift to the Calcutta University and expresses the hope that his example would be followed by others.”

(Moved from the Chair.)

The resolution was carried unanimously.

Sixteenth Resolution.

OFFICE BEARERS.

The Hon'ble Babu Krishna Sahay :—Gentlemen, this is a formal resolution dealing with the appointment of Office bearers and a Standing Committee to carry on the work of the Industrial Conference during the forthcoming year. The resolution runs thus:—

“ The Honourable Rao Bahadur R. N. Mudholkar be appointed General Secretary of the Indian Industrial Conference for the next year. Mr. N. A. Dravid, Honorary Assistant Secretary and Mr. M. B. Sant, Assistant Secretary and this Conference appeals to the public for a sum of Rs. 8000/- to carry on the work of the Industrial Conference.”

It is the duty of every one of us, if we care for the development of the industries of our country to put our hands into our pockets and subscribe as much as possible for the success of the industries. I dare say that Rs. 8,000 is an absolutely insignificant sum taking into consideration the vast amount of good to which this sum will be put. They have put a very modest sum of Rs. 8,000 and it should not be difficult to raise that sum in a country like ours. Surely we can raise at any rate 8,000 rupees. This Conference also deems it desirable that there should be a Standing Committee appointed for each year to co-operate with the General Secretary in carrying on the work of his office

during the year and to advise him on all such matters as he may submit to them and that the following gentlemen do constitute the Standing Committee for the year 1913:—

Sir R. N. Mookerji.

Lala Harkishan Lal.

Mr. J. Chaudhari.

Sir Vithaldas D. Thackersey.

Mr. D. E. Wacha.

Hon'ble Mr. Lalubhai Samaldas.

Diwan Bahadur P. Rajarathna Mudaliyar.

Dr. Satischandra Banerjee.

Mr. C. Y. Chintamani.

Rai Purnendu Narayan Sinha Bahadur.

Hon'ble Mr. M. B. Dadabhoy.

The Hon'ble Babu Krishna Sahay.

Hon'ble Rao Bahadur R. N. Mudholkar (*Ex-officio*).

The name of Mr. Hassan Imam is mentioned here. It was put in last year, when he was a free man. But now that he is an official his name is to be omitted. This is only a formal resolution and I do not think it necessary to make any speech.

Mr. Jogindranath Sammaddar:—The resolution which has been so ably moved by the Hon'ble Babu Krishna Sahay needs no words to support or to second it. As you know the resolution can be divided into three parts. First the appointment of the Office bearers, secondly the question of money, and thirdly a Standing Committee to carry on the work of the Conference. As regards the Office bearers, the Hon'ble Rao Bahadur R. N.

Mudholker is proposed to be appointed the General Secretary of the Indian Industrial Conference. His name is a household word in India and he has been elected this year to the Presidency of the Indian National Congress and I think it has been justly said that it is the highest honour which an Indian can aspire to. (Cheers). Mr. Mudholkar is the life and soul of this Industrial Conference. It is to him and to him only that this Conference owes its very existence. I am quite sure that you will all carry with acclamation that the Hon'ble Rao Bahadur R. N. Mudholkar be appointed General Secretary of the Indian Industrial Conference. (Cheers.)

Mr. Dravid has been acting as honorary Assistant Secretary and he is also doing useful work. Then Mr. Sant is to be the permanent Assistant Secretary. He is the only whole time man to do the work of the Conference. I know full well the work he has been doing with great zeal and enthusiasm. I therefore propose that Mr. Dravid be the Honorary Assistant Secretary and Mr. Sant be the Assistant Secretary.

As regards the question of funds, you all know that nothing can go on without funds or as they call it, the sinews of war. I earnestly appeal to you to contribute as much as you can afford to spare. It has been repeatedly stated and brought home to our minds, that the first thing which India requires is her industrial regeneration. The Indian Industrial Conference has been able to do something in this direction (Cheers). It has earned the approbation and the sympathy of Government as well as the active co-operation of the people and it is our earnest desire and our sacred duty that we should all help it as much as possible.

Then there is the question of the appointment of a Standing Committee. You have here all the names so familiar to you. Sir R. N. Mukerjee is the senior partner of the well-known firm of Messrs. Martin & Co. Those of you who belong to Behar know the Behari Bakthepur Railway. If you make an estimate of him from that Railway, you will make

a bad estimate. (Laughter). It is the only Indian firm which is a competitor of European firms and Sir R. N. Mukerji is associated with it. Lala Harkishan Lal, our worthy President combines in himself qualities of head and heart. Then comes the name of Mr. J. Chaudhri of Calcutta. Sir Vithaldas D. Thackersey is a very eminent man of Bombay. Mr. D. E. Wacha is present here and he is one of the General Secretaries of the Indian National Congress. Mr. Lalubhai Samaldas, Mr. P. Rajarathna Mudaliar—these are familiar names. Mr. C. Y. Chintamani, the able editor of the Leader, is a man of whom I can confidently say that has got an old head on young shoulders. Then occurs the name of Rai Purnendu Narayan Sinha, Bahadur, I am quite sure you are quite familiar with his work. (A voice—He is the Mudholkar of Behar). Yes that he is. Mr. Dada bhoj is a familiar name. To the Hon'ble Mr. Krishna Sahay—one of the very worthy sons of Bihar I may say, that the success of this Conference is due owing to his untiring efforts. Then we have the Hon'ble Rao Bahadur R. N. Mudholkar who remains an ex-officio member. I do not think I have anything to add to this resolution. I am quite sure you all approve the selection of these gentlemen whose names are put in the Committee, and those gentlemen who are to act as the Honorary Secretary, Honorary Assistant Secretary and the whole time Assistant Secretary. With these words, I commend this resolution to your care. (Cheers.)

The resolution was put to the vote and carried unanimously.

Vote of thanks to the Chair.

The hon'ble Mr. Justice Hasan Imam:—Gentlemen, at this late hour of the day when you have been here since about 12 o'clock midday, I have no doubt you are all wistfully looking forward to your liberation from this hall to go into the vast canopy of the sky. It would, therefore, seem somewhat unseemly, if I were to attempt to detain you for the consideration of another resolution. You are aware that the list of resolutions

has been exhausted, and, therefore, it must be some resolution that finds no place in the list but which yet must be very important that I have ventured to stand up to propose before you. For the last few days, our town has had the honor of receiving a large number of guests,—distinguished guests—from all parts of India; and now to-day I believe it the last ceremony of the series of ceremonies that had been exciting your imagination and satisfying your desires. It falls to my lot to say the last word that has to be said in respect of the closing part of these ceremonies, excepting of course whatever may yet fall from the President of this Industrial Conference. I intend to propose to you a vote of thanks to the Chair. (Cheers). Mr. Harkishan Lal at considerable sacrifice of time—in his case knowing as I do how valuable his time is—sacrifice of money as well, has travelled a very long distance to come here and preside over this Conference. Not that in this case, I ask you to value his services by the standard of money, but I ask you to value his services by the trouble he undertook to come here to render you the services that he has rendered. Gentlemen, Mr. Harkishan Lal has discharged his duties in a manner which perhaps language does not possess words to express the appreciation of; and as Chairman of the Reception Committee, an honor to which the Committee invited me, I feel that I shall not be doing my duty, if I do not propose this resolution before you and I feel in this particular case a personal satisfaction inasmuch as I have had the honor of knowing Mr. Harkishan Lal for some years and of having honored his name even before I had the privilege of knowing him personally. (Cheers). That Mr. Harkishan Lal has been of immense support to every industrial movement in the Punjab is well-known and it is from the Punjab that you find the radiation of those happy and healthy influences in the industrial world that have gone to make Northern India better than it was before the activities of Mr. Harkishan Lal. (Cheers). Therefore in asking you to pass this vote of thanks to Mr. Harkishan Lal for his courtesy, for his consideration, for the every affable manner in which he has discharged his duties to-day, I am sure

I am not asking you to lay on yourselves any burden whatsoever. I am fully confident that you will pass this vote of thanks to Mr. Harkishan Lal with acclamation. (Loud Cheers).

The President's concluding address.

The President:—Hon'ble Mr. Hasan Imam and gentlemen, it is very difficult indeed for me to return in adequate words the obligation under which I have been laid by the kind words of your Chairman and by the kind action of your Committee, who invited me to occupy this high position to-day. Gentlemen, I will not take up your time in making a speech, but I can assure you that the work of presiding to-day has been the least onerous of all the works that I have done in my life. There has been absolutely no trouble whatsoever by the way in which you have so kindly treated me. I cannot conclude my remarks without asking you to pass a vote of thanks to the Chairman, the Hon'ble Mr. Hasan Imam and to the Secretary of the Reception Committee, the Hon'ble Mr. Krishna Sahay (Cheers), and his Assistant Mr. Sammaddar and various other gentlemen who have been kind enough in organizing such a kind reception and such a grand meeting; but before I conclude you will agree with me that, if any thanks are due to me for taking the trouble that Mr. Hasan Imam has described, then how many times more thanks are due to the Hon'ble Mr. Mudholkar (prolonged Cheers) who has given not one day or two days but years of his life to the service of this country. (Cheers). The Conference is closed.

Three Cheers for Lala Harkishan Lal were called for and heartily responded to.

Three Cheers for the King-Emperor, were also called for and heartily responded to.

Then three Cheers were called for the Viceroy and heartily responded to.

The Conference then dissolved.

Development of Industries

IN

Travancore.

BY

Dr. N. Kunjan Pillai, M. A. B. Sc. Ph. D.,
Director of Agriculture, Travancore.

Travancore, like the rest of India, is essentially an agricultural country. Out of the total population of 3,428,975, as many as 2,240,483 or 66% are dependent directly or indirectly upon agriculture, while only 590,143 or 17% are supported by industries. Owing to the pre-eminence of agriculture in Travancore, any attempts for the development of her material resources and the enhancement of the welfare of her people must be directed first and foremost towards the improvement of her agricultural conditions. Rightly, therefore, the Government of Travancore, following in the footsteps of Imperial and Provincial Governments in India, have realised the necessity of reforming the agricultural methods and practices in the State, and with that end in view have organised a Department of Agriculture which is steadily though slowly carrying on the work of reformation. It may be said with just pride, therefore, that the question of agricultural improvements receives due attention at the hands of the Government and the people of Travancore, though the same cannot be said with regard to the development of industries.

Industrially Travancore is very backward. Very little has been done by Government till now for industrial advancement, but there are signs of a move being made by them in this direction in the near future. The necessity for such a move which is sure to result in increasing material prosperity to the State is admitted by all right-thinking men. But as in British India, there are to be seen in Travancore also a few representatives of

the school of men who delight in disclaiming everything that is modern and praising all that is old and traditional. In their opinion, in matters industrial India should not go forward on the lines chalked out by the western nations, but should retrace her steps and go backward to those early times when she was a self-contained unit and the Indian society a well developed organism whose different parts being interdependent upon each other worked harmoniously towards the common weal. They imagine that this past was a period of millennial happiness in India and they earnestly wish and pray for the revival of the state of affairs that existed in those days. In doing so they point out, sometimes in exaggerated terms, the evils of industrialism in the West and warn us against similar evil consequences in India, if our industrial development were to proceed on the lines of the Western methods. Unfortunately the question of the practicability of the revival of the old order of things does not seem to trouble the minds of its few advocates. At a time when the people of India were divided into a number of distinct classes and when the large majority of them were kept in utter illiteracy and ignorance and thereby under subordination to the rest, there might not have been any difficulty at all to impose distinct occupations on different classes and make each class confine itself to the occupation assigned to it. But the times have now changed. With the advent of the benign British rulers in India, education has spread far and wide and reached even the lowest classes. In the wake of educational progress the mental horizon of the people has widened, and ideas of self-respect, freedom, and individuality have permeated through the whole society from the Brahmin to the Pariah. It is no longer possible therefore to hall-mark one class of people as carpenters for ever, another as blacksmiths for ever, a third as slavish labourers for ever and so on, and tell them to rest content with their lot however miserable it be compared with that of others, who by mere accident of birth assume a sort of superiority in everything mundane. If India wishes to revive in its pristine form and maintain in its entirety the hereditary system of labour, so that she might once again become a self-contained unit, she must bid

Farewell to all the existing conditions and cut at the root of all those civilizing forces which are influencing the modern Indian society. She must, for example, break all communications with the outside world and become an isolated unit, her educational activity must be checked, and education must be confined to a limited few as in olden days; her railways and other internal communications must be abolished; her newspapers and journals must be put out of existence; and in fact everything that tends to diffuse progressive ideas among the people must be done away with. No one will even dream of such a course of action being followed by any Government, however autocratic and conservative it be. Let us, therefore, dismiss as impracticable the vociferations of a few orthodox conservatives who cry in season and out of season for the rehabilitation of the hereditary system of labour; and let us like a progressive nation develop our industrial resources on up-to-date lines. In doing so let us benefit ourselves by the experience of the Western nations and guard ourselves from the very outset against the pitfalls of their industrialism by efficient protective and preventive measures.

With these few general remarks I shall proceed to the considerations of the industries that now exist or that can be brought into existence in Travancore and try to find out how best they could be developed.

To get an idea of the condition of industries in a country one cannot do better than refer to its export and import trade. The trade returns of Travancore for the year 1910-11 are given below :--

Exports.

Name of article.	Value.
1. Copra ... ..	...Rs. 77,37,616
2. Cocoanut oil ... ..	... ,, 24,16,266
3. Cocoanut cake ... ..	... ,, 5,03,186
4. Cocoanuts ... ..	... ,, 5,51,786

Name of article.				Value.
5.	Coir	...	...	Rs. 53,42,225
6.	Coir mats	...	...	,, 14,96,371
7.	Cable	...	...	,, 4,213
8.	Coir fibre...	...	...	,, 12,495
9.	Cocoanut husk	...	...	,, 57,222
10.	Jaggery (Palmyrah palm)	...	...	,, 3,35,350
11.	Jaggery (sugarcane)	...	...	,, 2,14,224
12.	Dry ginger.	...	...	,, 9,77,075
13.	Pepper	...	...	,, 28,13,156
14.	Fish	...	...	,, 5,00,701
15.	Hides	...	...	,, 2,46,200
16.	Other articles	...	...	,, 1,38,91,323
				<hr/>
Total Rs...				3,70,99,409

Imports.

Name of article.				Value.
1.	Piece goods	...	...	Rs. 8,41,979
2.	Thread	...	...	,, 5,40,166
3.	Cotton	...	...	,, 29,56,166
4.	Rice	...	...	,, 20,24,136
5.	Paddy	...	...	,, 60,45,818
6.	Tobacco	...	...	,, 11,36,148
7.	Hardware...	...	...	,, 2,06,821
8.	Provisions..	...	...	,, 1,25,744
9.	Machinery..	...	...	,, 1,07,467
10.	Salt	...	...	,, 3,40,532
11.	Gingily oil	...	...	,, 1,25,588
12.	Glassware...	...	...	,, 1,45,768
13.	Liquor	...	...	,, 2,28,100
14.	Sundries	...	...	,, 49,54,645
				<hr/>
Total Rs...				1,97,79,586

It will be seen from the above tables that the main articles of export are the products of the cocoanut palm, pepper, ginger, jaggery, fish and hides, which are mostly raw materials, and the chief articles of import are rice, paddy, and other provisions, piece goods, cotton and thread. Under import are also included, though they are not separately shown in the returns, soaps, candles, sugar, matches, paper and a number of other manufactured articles. The point to be specially borne in mind is that the export consists mostly of raw products, and the import to a great extent of such articles as are manufactured out of the raw materials exported from the State. Bearing this in mind let us take up for consideration the different industries one after another.

Weaving.—Among industries the first place must be given to weaving, for next to food clothing is the most essential requisite for man. There is no country in the world in which the art of weaving has not been developed from early times. In India weaving has been from time immemorial a thriving cottage industry, until the introduction of machine made cloths. Since then, there arose the competition between foreign power looms and native hand looms and it has at present assumed such formidable dimensions that the native hand-loom industry is threatened with complete destruction.

According to the latest census in Travancore, only 35,597 persons subsist by cotton ginning, spinning and weaving. As there is very little of cotton ginning and spinning in the State, it may be taken that almost all these persons are engaged in weaving. This means that one in every 96 of the population is a weaver in Travancore, while in the sister State of Baroda, whose population is less than that of Travancore, 36 out of every 1000 of the population are engaged in textile industries, chiefly weaving. The production of cotton goods in Travancore is not at all sufficient to meet the requirements of the people, for annually she imports piece goods to the value of 8 to 9 lakhs of Rupees. Though the demand for such goods is far in excess of the local supply, not a single power loom has

yet been started in the State. Of course it owns a number of hand looms which, in spite of the keen competition of foreign power looms, are able to consume annually more than 35 lakhs of Rupees worth of cotton and thread. The existence and present condition of these hand looms are to be attributed to the peculiar taste of Travancoreans. They have a special fancy for certain kinds of fine cloths which can be turned out in the hand looms only. As long as this taste remains unchanged the handloom industry may continue to exist; but it is fast changing and the condition of the industry cannot but be regarded as precarious. Everywhere else in India efforts are being made to improve the hand loom industry by the introduction of up-to-date looms and the diffusion of technical knowledge. In this respect Travancore lags behind, and unless she follows in the wake of activity in other parts of India it is doubtful how long her hand loom industry will be able to hold its own against the competition of improved hand looms and power looms of foreign countries.

Spinning.—Travancore is not a cotton producing country. The yarn required for her hand looms comes from outside. Owing to the facilities she possesses in importing cotton from Bombay by sea and from Tinnevely and other adjoining British districts by land, she can well afford to have a few spinning mills of her own. One such mill worked satisfactorily under European management at quilon from 1884 till 2 or 3 years ago, when it passed into the hands of some Indians. Under efficient management and expert supervision the regeneration of this mill and the establishment of more of its kind in the State ought to be practicable.

Lace and hosiery making.—Through the influence of the Christian Missionary ladies lace making has been introduced into Travancore as a cottage industry and has become the means of subsistence to many a poor family. Those who are engaged in it are chiefly the women converts among the *Chanars* and

Pulayas, the so-called depressed classes, among whom the Missionary influence is seen most. These women are supplied with thread by the Missionary ladies, and the lace produced is collected and exported by them to Europe. The lace made in Travancore is considered to be of superior quality and has won medals and prizes at several exhibitions held in Europe and India. It is said that a woman working during intervals of leisure, say about 3 to 4 hours a day, is able to make an earning of 3 to 4 Annas per diem. What a blessing this is to the poor *Chanar* and *Pulaya* women who under ordinary circumstances cannot earn more than 2 or 3 Annas a day, and that only by hard work in the field under the scorching sun from daybreak till evening !

The lace industry is still in its infancy in Travancore. It is now confined to the Christian women of *Chanar* and *Pulaya* classes. It can surely be extended among the women of other classes as well, among whom also there are many poor families to whom an income of 4 Annas per head per day will be a source of great happiness and joy.

Another cottage industry suitable for the women of Travancore is hosiery making, which has not yet found its way into the State. Hand machines for this purpose are available at moderate prices, and it is said that with a machine costing about Rs. 150, one person will be able to earn one to two Rupees a day. What a boon it will be to the half-starved women and their families if they could be initiated into this profitable industry !

Oil-pressing and allied industries.—The chief oils available in Travancore are those of cocoanut, gingelly, *Calophyllum inophyllum*, *Pongamia glabra*, *Bassia longifolia*, and lemon grass. Of these by far the most important is the cocoanut oil. A large quantity of it is consumed in the State itself chiefly for culinary purposes, and a much larger quantity is exported to foreign countries. The oil for local consumption is mostly produced in primitive country mills, of which there are a large number

scattered over the whole State and the oil for export is mainly produced in factories. There are about 12 such factories in Travancore most of which are situated in Alleppey, the most important commercial town in the State. In these factories the oil is pressed out of copra by means of power driven iron mills. Till a few years ago oil mills in Travancore were paying well, but they are not so at present. The demand in Europe now is more for copra than for oil, and consequently there is a steady rise in the price of copra whose export has thereby been considerably enhanced, while the depression in the price of oil has greatly lessened its export. If such a state of affairs continues for some time to come, the oil industry in Travancore cannot but meet with failure, unless protected by special means early enough. By the introduction of up-to-date scientific methods of oil extraction and oil purification Travancore mill owners may be able to hold their own against their co-professionists in Europe for a considerable length of time ; but they can attain permanent success in competition with European firms, only by starting in Travancore such auxiliary industries as the manufacture of soaps, candles, cocoanut butter, etc., so as to do away altogether with the necessity of exporting either copra or oil to foreign countries. As raw materials are available in abundance there is not the slightest doubt about the success of such industries in Travancore, provided they are conducted under efficient management and expert advice with a sufficiently large capital. If there are any industries for which Travancore is well adapted, they are the industries connected with oils. The question of their development in the State deserves the careful consideration of the Government and of such people as are interested in industrial advancement.

Fibre industry.—*Kerala*, of which Travancore is the most prominent portion, is rightly called the land of the cocoanut palm. A considerable portion of the cultivated area in the State is under this palm, and its products form about 50% of the export trade of the country. In the year 1910-11 coir and coir mats alone were exported from Travancore to the value of

more than 68 lakhs of Rupees, and these easily hold the first place among the industrial products exported from the State.

The coir industry is so far only in the stage of cottage industry in Travancore, the people engaged in it being mostly the *Eshavars* residing near the backwaters which extend with very little interruption from near Trivendrum right up to the north, along the coast. The native methods of the preparation of fibre and its conversion into coir are simple and somewhat primitive ; but owing to the special care and skill of the workers the coir they produce is ordinarily superior to the product turned out of coir making factories in other countries. It is too early yet to consider about the question of starting such factories in Travancore, for local labour is still cheap, and the hand made coir finds a ready sale in foreign markets. The problem that requires immediate consideration is the manufacture of mattings, rugs, brushes and other articles from coir. The trade returns show that, whereas the value of coir exported from Travancore in 1910-11 was nearly Rs. 53½ lakhs, the value of coir mats, cables and other manufactured articles exported in the same year was only a little over Rs. 15 lakhs. The coir that goes out of the State is no doubt used for the manufacture of such articles and there is no reason why this work cannot be done in this country itself. Here is a vast field for native enterprise. Let our rich brethren divert their talents and money in this direction. There are in Travancore 2 or 3 factories engaged in the manufacture of coir mats and other articles, and all of them are, I believe, in the hands of Europeans.

Among other fibres available in Travancore mention must be made of plantain, palmyrah palm and aloe fibres. Plantain is one of the widely cultivated crops in the State. The existence of fibre in the leaf sheaths of plantains has been known to Travancoreans from time immemorial ; but no serious attempt has been made to extract the fibre and export it to foreign countries. No less than 29 varieties of plantain are cultivated in the State. All of them yield fibre good for cordage, while

about 12 varieties yield fibre of a fine texture which can also be used for weaving cloths.

Palmyrah palm fibre is extracted from the mid ribs of the palm leaves. The palm grows extensively in South Travancore and the fibre industry is mostly in the hands of the *Chanars* and other low classes of that part. The fibre is short and coarse and is well suited for making rough brushes.

The aloe fibre industry exists on a very small scale in some portions of Shencottah Taluka which lies close to the Tinnevely District of the Madras Presidency. The industry is mostly in the hands of the low class people, the fibre being extracted from the leaves of aloe plants growing wild in those parts. The fibre that is produced is purchased by merchants and sold in a lump to European firms in Tuticorin and other places.

Travancore affords facilities for the development of the minor fibre industries mentioned above. Raw materials are available in large quantities and more can be produced by extending the cultivation of the fibre yielding plants. What has to be done immediately is to appoint a fibre expert and establish schools under his supervision for training the people in the proper methods of extracting the fibres. Such a step will surely give an impetus to the development of those industries in the State. Its progress can further be quickened by the establishment of a central agency for collecting the fibres and exporting them to countries where there is a demand for them, an agency which must work in co-operation with the producers, so that they may get sufficient compensation for their labour and their due share in the profit.

Sugar-refining.—Travancore has nearly 10,000 acres under sugarcane and has ample facilities for extending its cultivation. All the sugarcane that is produced in the State is used in the manufacture of a brown amorphous mass of sugary matter ordinarily called jaggery. A somewhat different kind of jaggery is also made out of the juice collected from the spathes of pal-

myrah and cocoanut palms. These jaggeries have been used in Travancore in the place of sugar from very early times. But with the advance of Western civilisation jaggery is going out of fashion and sugar has become an indispensable article of diet to a good many whose number is steadily on the increase. Owing to the apathy of Travancoreans in industrial advancement they are now obliged to get sugar for their use from outside and at the same time export all the jaggery they produce to other countries. The value of the jaggery export came to nearly Rs. 5½ lakhs in 1910-11. Probably the very jaggery that is exported from here goes to some foreign sugar refineries and returns, after undergoing some changes, as brown or white sugar to be purchased and consumed by the Travancoreans. This is surely a deplorable state of affairs, and the question of mending matters by establishing up-to-date sugar refineries in the State deserves the careful consideration of all interested in the welfare of the country.

Paper industry.—Travancore possesses only one paper mill and that too has not been working satisfactorily for the past many years, probably owing to the difficulty of getting sufficient raw materials, and other causes. The materials generally used in the mill are old gunnies, rags, and torn paper, which are difficult to obtain in large quantities at cheap prices. No attempt has ever been made for the utilisation of grasses, bamboos and the numerous species of paper yielding soft wood found in abundance in Travancore forests. The question of transport will no doubt present considerable difficulty in this case and it can be overcome only by the establishment of factories for the manufacture of wood-pulp at convenient places within the forests. Such factories are likely to be more paying in Travancore than paper mills, because of the availability of an abundant supply of soft woods suited for the manufacture of wood-pulp.

Match industry.—Another industry which can be worked successfully in connection with Travancore forests is the manufacture of matches for which also several species of our

soft wood have been found suitable. The present Conservator of Forests in Travancore has published a memorandum on "Match factories in Southern India" in which he has pointed out the scope and facilities for the development of the match industry in Southern India and particularly in Travancore. As a result of this, a company has been formed with a view to open a match factory in the State and has secured from the Government certain liberal concessions for their undertaking. If the company sets about on proper business lines and takes care to secure the services of a well qualified expert, Travancore will surely earn the credit of being the pioneer in match industry in Southern India.

Sericulture.—There is no record or tradition to show that silk-worm cultivation was ever carried on in Travancore, though there is sufficient evidence to the fact that a professional class of silk weavers, known as *Pattunulkars*, existed in this State at one time and that somehow or other the class as a whole, and its profession practically became extinct. Attempts are now being made for the introduction of sericulture as a cottage industry into the State. An Experimental Silk Farm has been opened by the Government some 2 years ago, and the success of the operation conducted therein goes to prove that the cultivation of both Eri and mulberry silk worms is practicable in Travancore except during the periods of heavy rains. If this conclusion is confirmed by further experience the popularisation of sericulture in the State ought to receive its due share of attention from the Government and the people.

Fishing.—I do not know if any other part of India affords better facilities for the development of fishing industry than Travancore. There is the sea skirting her on the west from Cape Comorin to Parur ; there is an unbroken chain of backwaters extending practically throughout the length of the country ; and there are numerous tanks and rivers scattered over the whole State, so that there is ample scope for the rearing of salt water and fresh water fishes. The Government of Travancore have so far done very little towards the development of this industry

and yet we find that the State exports nearly Rs. 5 lakhs worth of fish annually. It is not easy to predict how much more this export trade would be if scientific methods of fish rearing, curing and canning were adopted. Let us wait and see, for Government have now made a move in the matter and probably ere long a well organised Fishery Department will come into existence.

Mining.—Travancore appears to be rather poor in mineral wealth. The only mineral that formed part of the export trade of the State for some years was plumbago. But owing to the inferior quality of the mineral the plumbago mines were closed about a year ago, and another more valuable mineral, namely monazite, has taken its place in the export trade. This new mineral, it is said, is seen all along the sea-coast and promises to yield a good revenue to the State for a number of years to come. Travancore has to remain satisfied with such limited activity in the sphere of mining industries until the existence of other useful minerals, ores or precious stones is discovered.

I have completed my account, though somewhat scrappy, of the existing and prospective industries in Travancore. The list is not by any means exhaustive; but I believe I have touched upon almost all those industries that are of importance. The question that has now to be considered is what has to be done for the development of these industries in the State. For convenience sake let us divide them into two groups, (1) cottage industries, such as hand loom weaving, lace and hosiery making, silk worm rearing, etc., and (2) factory industries, such as oil pressing, soap and candle making, sugar refining, etc.

For the development of cottage industries what is most urgently required is the establishment of technical schools for providing the necessary training in the practical side of the different industries to such young men as have a taste for them. Schools of this kind are indispensable both for the improvement

of the existing cottage industries and for the introduction of new ones. A loud cry is heard all over India for the organisation of technical education without which, it is said, the country cannot hope to make substantial progress in industrial development. All that is talked of in connection with technical education may not be quite practicable, and hence a note of warning is being sounded—of course rightly too—by some people here and there. The impracticability of carrying out the various schemes suggested by different persons is no justification for condemning technical education as a whole, as done by some. As far as Travancore is concerned, it is more or less certain that no material development in her cottage industries is possible unless and until a proper system of technical education has been established ; and I believe the same will hold good in the case of such industries in other parts of India also.

Coming now to factory industries one must admit that Travancore is too small to be able to undertake the establishment of big technical institutes for the training of men in such industries. All that she requires for the present is a few specialists and for this purpose students might be sent to Europe and given the necessary training. To avoid disappointment and ridicule it is very essential that students are sent for specialising only in such industries as have a fair chance of success in Travancore. Otherwise Europe-returnd specialists will have to go about in the country in search of employments which cannot be had here. For the success of the scheme it is also essential that students who go to Europe should equip themselves thoroughly in the theoretical and the practical side of the particular industries in which they specialise, so that they may be in a position to initiate and carry on successfully those industries in their native land on their return. There are several instances in India of the failure of Indian undertakings caused by the absence of expert knowledge and business habits on the part of the organisers. Such failures cannot but be ruinous to the cause of industrial development in the country, and they can surely be avoided if the organisers of new industries proceed with sufficient orethought and act under expert advice.

So far, we have seen that the first requisite for industrial development in Travancore is the organisation of technical education for cottage industries, and the training of a few specialists in factory industries. The next requisite is the establishment of an agency, something like the Commercial Intelligence Department of other countries, to act as intermediary between the producers and the consumers, whose duty it must be to supply the people with information about the foreign markets where their wares will find a sale. The merchants in Travancore are greatly handicapped for want of correct information on this point. They now depend for this on the agents of European firms who for the self-preservation, do not give publicity to all the particulars unreservedly.

The third requisite for success in industrial development is the spirit of co-operation among the people. Without co-operation very little can be achieved either in cottage or factory industries. In the case of the former the enterprise is confined to single individuals or families, and production can be only on a small scale. The product turned out by different individuals should be collected and sent out to foreign countries in large quantities. This work is generally undertaken by middlemen and they are able to appropriate to themselves a large portion of the shares that ought to legitimately go to the producers who are generally ignorant of the conditions of the foreign markets. This evil can be remedied by the formation of co-operative societies composed of the producers themselves, who should undertake the collection and export of articles, as is being done with dairy products in Denmark, and egg in Germany. In that case the whole profit will be distributed among the producers themselves, and it will be a stimulus for the further development of the cottage industries.

In the case of factory industries too, co-operation is of equal importance. The establishment of factories necessarily requires a large outlay and the capital required for that purpose cannot be collected in India at present without the co-operation of several individuals. The absence of a sufficient capital is one

of the causes of the failure of Indian industrial enterprise. The effect of insufficient capital makes itself visible in two ways, firstly in the tendency of the organisers to effect economy even at the sacrifice of efficiency, one potent and common example of which is the investment of money in old rotten machinery, and secondly in the inability of such industrial companies to compete with firmly established and well funded European firms. Instances of the failure of factories caused by the equipment of cheap machinery are not rare in Travancore, and instances there are, though not in Travancore at least in India, of the failure of Indian enterprise due to the competition of European firms. To guard against failures of these kinds, Indians who venture into new industries must start with a sufficiently large capital which it is possible to collect only by the unstinted co-operation of the people. Where there is such a co-operation there is no difficulty to raise any capital required. It is idle talk, the usual stocking trade of men who hold certain peculiar theories, to say that India is poor and she cannot afford to invest capital in industries. Capital she has enough, but only most of it remains idle and unproductive. There is a great deal of truth in the statement that Indian capital is shy ; but this shyness is due more to the lack of co-operation among the people than, as it is believed by some to their scepticism as to the success of new undertakings, for, even in industries in which success has been assured through the work of Europeans, Indians are not coming forward to invest their capital. It is more or less certain that until education has permeated through the whole society and enabled the people to appreciate the value and importance of co-operation, Indian capital will continue to be shy. It is matter for gratification that education is spreading very rapidly, carrying with it the wholesome influence of Western civilisation ; and probably the time is not far distant when we may see among Indians the right spirit of co-operation.

However well the people may co-operate and however hard they may work for industrial development, nothing much can be done in that direction, especially in a country like Travancore, without the substantial help and sympathy of the Govern-

ment. Opinion is not unanimous in this matter. There is one set of people who deprecate State interference in industrial enterprise, and there is another set holding just the opposite view. The lesson taught by Germany and Japan where industrialism is of a comparatively recent growth is that, without the help of the State at least in initiating new industries, progress in industrial advancement will be very much retarded. If this is so in the case of Germany and Japan much more should it be so in the case of Travancore and India. Of course undue help or interference from the State is always detrimental to industrial progress and should not be encouraged. But that is no reason why certain concessions and financial aid though on a limited scale should not be granted to the organisers of industrial undertakings. In fact such concessions and help will, instead of thwarting private enterprise, only stimulate its growth and development. The State, I think, will be quite justified in granting small loans, or rendering financial help in other ways under proper advice and sufficient guarantee for the starting of new industries, just as it helps ryots with loans for agricultural improvements. If the State does this, and if, as I have already pointed out, it also organises a proper system of technical education for the development of cottage industries, trains specialists in profitable factory industries and creates an agency for bringing within the reach of the people a correct knowledge of the conditions of foreign markets, and if the people on their part take advantage of these facilities and acting with a spirit of co-operation boldly enter into industries which have a reasonable guarantee of success, Travancore can surely look forward to a glorious future of industrial activity and material advancement.

THE COPPER & BRASS INDUSTRIES OF INDIA.

BY

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INTRODUCTORY.

There could be no doubt that India at one time occupied a prominent position in the metallurgical world, as judged by the high quality of the Indian iron, by the early anticipations of the processes now employed in Europe for the manufacture of high class steels, by the artistic products in copper and brass, and by the relics of ancient work seen at present. The famous iron pillar at the Kutub Minar near Delhi—a solid shaft of iron 23 ft. 6 inches height 16·4 inches in diameter and weighing 6 tons—is still a formidable task from the standpoint of the present day manufacturer. The huge copper statue of Buddha at Sultanganj, which has elicited remarks of praise and wonder from authorities on Indian art like Fergusson* and Birdwood, and the superb artwork in hammered and perforated brass, which can be seen in many temples, tombs, and mosques, bespeak highly of the stage of perfection to which the Indian Metallurgical industries had once reached. However this lovable excellence is no more seen in India at the present time. The manufacture of iron, excluding that by the Tata Iron and steel works, and the Barakar Iron works, is restricted, only to those areas that are far removed from the railways, which distribute the cheap imported article. Copper and brassware are made entirely from imported materials, and almost every attempt to work the known copper deposits have come to grief.

* Fergusson, History of Indian and Eastern Architecture, p. 137.

Birdwood, Industrial Arts of India, Vol. II, p. 146.

The use of different metals for the making of domestic vessels marks a stage in the growth of nations. Perhaps the most ready materials that presented themselves to the primitive men for this purpose were the dried up fruits like wild gourd, etc. These were copied in wood and stone as they progressed, while the next step was the making of unbaked and baked clay vessels. The discovery of the metals like copper or gold, which were melted by the forest fires, drew their attention to the possibilities of the use of these metals for the purpose of making the domestic requisites. From copper to brass was an easy step to those familiar with the working of the metals. In western countries we find the metal vessels again displaced by porcelain, enamelled and glassware, which are produced cheaply there on account of the well developed condition of the latter industries. This substitution of the metals by ceramic ware is likely to take a very long time in India and so she will remain in the metal stage for a pretty long period. The peculiar dislike that is felt among the Hindus towards vessels of porcelain or clay on religious and economic grounds makes the position of the metal industries of India fairly secure.

It might be noted in this connection that the Copper and Brass industry, such as is practised now in India, has successfully held its own against foreign competition and is little likely to be directly affected by the same. This has been possible on account of the great diversity in shape, size, and pattern of these vessels in different parts of the country, which does not permit of manufacture by a factory far removed from the market.

Again, there is an interesting feature of the industry which makes the study peculiarly fascinating. The Indian farmers have, on account of their poverty, to use earthen vessels even though they dislike them; they invest a great portion of their savings in buying the copper and brass utensils which form the family heirloom. However, few farmers can afford to

The Influence of Foreign Competition.

Metal Utensils: "Marginal Luxuries".

keep up these "marginal luxuries"; in times of scarcity these have to be sold away and may be bought again in times of prosperity. This phenomenon shows how great is the demand for brass and copper vessels which is kept in check only by periods of scarcity and high prices. So complete is the correspondence between the sale of these vessels and times of prosperity that the farmer can be used as a kind of barometer for the latter. This will be further clear from the following quotation* :— "The supplies of brass and copper are wholly or almost wholly derived from the foreign countries and fluctuate largely with local needs and prices. Copper, being the chief metal used for domestic utensils and easily saleable when necessity arises, is in large demand in times of plenty, and is instantly thrown on market in bad

An Index for the Prosperity of the Farmers.

years, so that the rise and fall of this traffic constitutes one of the safest indications by which to judge of the economic condition of the people of India. The following import figures may be recorded:

1876-77	241,000 cwt.	1900-01	160,000 cwt.
1897-98	322,000 "	1901-02	194,000 "
1899-1900	91,000 "	1903-04	433,000 "

The fall in 1899-1900 was the immediate effect of the scarcity and famine that prevailed in those years. Recently the demand for electric traction and lighting have somewhat increased India's needs for copper, but the quantities above given may be accepted as indicating roughly the amount required by the Indian coppersmiths."

The study of the Brass and Copper industries of India derives its peculiar importance also from the undeveloped state of the Indian Ceramic Industries. The fact that the glass, porcelain, pottery and enamelled ware industries are to be developed. The undeveloped state of these latter industries, and the religious prejudice the majority of the Hindus have in using earthen things for cooking or eating purposes, go a great way in securing

* Imperial Gazetteer of India, Vol. III, p. 237.

a steady market for the articles made from these metals.

Necessity of the Development of the Metal Industries.

The necessity of developing and improving the industry in these metals also arises from the backward state of the ceramic industries, and cannot be too much insisted on. Though it was pointed out that the industry has not suffered directly from foreign competition, it must be noticed that the introduction of cheap foreign glass, porcelain, enamelled, tinned, and galvanised articles, accompanied by a corresponding change in the attitude of the educated Indians towards European customs and things, is likely to upset the manufacture of brass and copper vessels in India unless more systematic and scientific methods of work are adopted. Already, the large costly vessels, that used to be the pride of rich men, are replaced by articles made of galvanised or tinned iron (*e. g.* Buckets, Bath tubs, etc.). The brass cups and saucers are being replaced by porcelain tea sets, and the introduction of cheap enamelled ware has displaced the copper and brass articles from many poor houses.

Imports of Enamelled Ware in 1911-12.

The following extract from the "Review of Trade of India" for 1911-12 shows the extent of the substitution:—"Enamelled ware is of peculiar interest as it is a substitute for the distinctive Indian vessels of copper and brass. During the years when the prices of these metals were very high, the importation of enamelled ware made great progress; and in 1907-98 the total value rose to Rs. 24.49 lakhs. But on the return of the copper prices to more normal levels the importation of enamelled ware declined until 1910-11, when the expansion was resumed and brought the total Rs. 19.03 lakhs. This movement has been greatly accelerated in 1911-12; and the advance recorded is one of Rs. 6.24 lakhs or 32.8 per cent., bringing the total to Rs. 25.27 lakhs. It may be noted that the imports of copper simultaneously showed a decline of 127,117 cwts., and of Rs. 67.71 lakhs in value." It should be also pointed out in the same connection that the imports of Aluminium have also increased. In 1898, when the first imports

of the metal had commenced, it scarcely amounted to 100 tons and £19,200; but in 1911-12 the imports reached 1,200 tons valued at 15·2 lakhs of Rs. As aluminium is solely used in India for the making of cooking utensils, its increased imports must have affected the sale of copper and brass vessels unless the demand had also increased at the same time.

Increased Imports of
Aluminium.

SECTION I.

The origin of the brass and copper vessels like many other things in India is shrouded in hazy antiquity. However there could not be any doubt as to the fact that the shapes of vessels in the present use was originally derived from the fruits, shells, horns, and leaves utilised by primitive men. The shape was changed in some cases to suit the changing fashions or necessities; the general tendency to substitute metallic vessels in place of the more transient and fragile articles of earthen ware or wood is seen even at the present day. This is well expressed by Mr. T. N. Mukkerji in his "Monograph on Brass and Copper Manufactures of Bengal":—"The dried up shells of wild gourds which hung handy from trees of the primitive times no doubt formed the first drinking cup of the earliest man in India. These shells are still used as such by religious *itinerants* whose austere life permits only the simple habits of prehistoric ages, but no luxurious innovations of latter days. But when the art of copying vegetable and animal objects was learnt, when gold and copper were discovered and the manufacture of brass invented, the householders began to make vessels and other articles of stone or metal similar in shape to that of the natural objects, employed in domestic use, chase, war, or personal adornment. In brass the gourd-shell gradually developed into the *Lota* and the *Ghati*; and in copper the scooped out rhinoceros' horn which on account of its comparative rarity and durability must have

The Origin of the Copper
and Brass Vessels of India.

been a very valuable utensil in ancient times, and the oblations poured out of which are still considered highly acceptable to gods and ancestral manes, became the sacrificial vessel called the *Kosha* of modern days. The large round leaf of the lotus, or the copy of it made by pinning together smaller leaves of other plants, which together with the plantain leaf is still used as a plate all over the country, is the origin of the modern *Thālā*. The half of the round *Bel* fruit rind or cocoanut shell, still used as a cup, spoon or ladle, gave the modern *Bāti* or *Katorā*. Hollowed pieces of wood still used specially in jungle tracts to keep water, milk, or pea-soup, during feasts and festivals, formed models for large brass jars called *Gharās*, or circular basins called *Gāmlās*. The iron arrowhead of latter times was the copy of the pointed deerhorn sharpened by rubbing it on stones, and the modern plough that of the forked branch of a tree used to scratch the soil in primitive agriculture. Similarly the flowers and the leaves of trees such as Champā, the Cocoanut and the Pān gave form to various brass articles of personal adornment."

The increased circulation of wealth after the introduction

Substitution of Clay Vessels
by Brass in modern times.

of railways in India and the consequent change in the notions and ideals of living, have been responsible for the substitution of household utensils formerly made of basketwork or clay by those of brass; brass vessels are preferred also on account of their portability, durability and greater purity. "The rice-washers made of shining brass, now glitters in every shop in Bengal, though that made of sliced bamboo is still almost in universal use. The vessel called *Hāndi* used to boil rice is being made of brass, though that made of clay is still used by the high and the low, as the former is costly, requires daily cleaning and scrubbing, and is said to make the food cooked in it heating and harmful. The incenseholder called *Dhunachi* may now be had of brass, though fifty years ago, that made of clay was solely used for burning Dhup and Dhuna of the Hindus and the Loban of the Mahomedans." Similar to the substitution of earthen ware by brass is the substitution of iron vessels by those of copper and brass.

In connection with the use of brass in India it is interesting to note that India had perhaps no bronze age corresponding to that in Europe. Bronze is an alloy of Copper and Tin which is not so popular in India as Brass which is an alloy of Copper and Zinc. According to some authorities, the metallurgy of Zinc was known in India very long time ago (the metal and its oxide being used frequently in Ayurvedic Medicine), and was then transmitted to the Western countries. However, a small quantity of bronze is still used in India under the name Kānsa or Phul, or bellmetal or white brass; it is preferred to ordinary brass in the making of ornamental ware, but is not considered sufficiently pure by the Hindus for eating or cooking purposes.

The use of Copper and Brass utensils among the Hindus is characterised by peculiarities of religious sanction which marks out these metals from others like Iron, Lead and Zinc which though known to the ancient Hindus have been discarded from religious and hygienic motives. In the code of Mann, vessels of gold and copper are said to be of first class purity, whereas silver and brass are put next, bellmetal coming the last. Iron vessels are thought to be impure for eating purposes, and it is believed that where they are used, gods and spirits of the deceased ancestors have no access. The order of the purity of the metals is dependent on the presiding deity, each metal being considered under the sacred patronage of a mythological deity. Thus Copper is presided over by the Sun, Silver by the Moon, Brass by Mangal, Lead by Budh, Pewter (alloy of Lead and Tin) by Shukra, Gold by Brihaspati (the preceptor of the gods), Iron by Shani, and Kānsa or Phul or Bellmetal by the demon-god Rahu. While the vessels carved out of shells, pearls, crystal or stone are put on the same degree of purity as gold, the earthen vessels are unfit for eating out of more than once. While the metallic vessels can be cleaned by scourging, &c., after eating from them, the earthen vessels have to be thrown away. This custom is seen even now at many places in Northern India where

Use of Bronze in India;
Zinc and Tin.

Religious Beliefs of the
Hindus about the Metals.

the custom of throwing away the earthen pots after their being once used eating or drinking purposes is followed rigidly ; of course the rule does not apply to vessels used only for cooking.

Local Variations.

How ever the religious injunctions are not interpreted in the same way in all parts of India. For example in some parts of the country brass vessels are invariably used after tinning, in some parts tinned brass utensils are polluted if touched by the low caste servants ; so also bronze vessels (of kânsa or phul) are not given to the servants for cleaning. Again though copper is considered to be a very " pure " metal it is scarcely used by the Hindus except for drinking purposes or for storing water ; perhaps the metal is consecrated to the gods and so too sacred for use by human beings. The sacrificial vessels used in worship are generally made of copper if not of silver.

The religious beliefs of the Mahomedans about the use of metals are very different from those of the Hindus. According to " Durr-i-Mukhtar", an authority on Mahomedan customs, "it is detestable to eat in brass and copper vessels; earthen vessels are better and more excellent; for the Prophet of God has said that those who keep these vessels in their houses are visited by angels". " It is not detestable to eat in tin, lead, crystal or cornelian vessels." "The use of gilded vessels is right according to all authorities,...for the gilding cannot be separated and is only a colour which is of no conservice." The jugs used by the Mahomedans have a spout generally, in accordance with an ordainment in the Koran that a man should perform his ablutions in running water, the falling of the water through the spout being considered equivalent. Though copper vessels cannot be used as such, they are acceptable if they are regularly tinned, so that the metal copper is always invisible.

In general it may be said that the Hindus are against the use of copper and earthen vessels for eating and drinking purposes, while the Mahomedans favour both though copper has

always to be tinned. The Mahomedans are against the use of the alloys but the Hindus prefer to use alloys, some of them like the Panchdhatu (alloy of five metals) being considered most sacred. Among the common alloys besides brass (copper and zinc) are Bronze, Kansa or Phul (copper and tin) and Ranga or Pewter (lead and tin). Out of these brass is preferred to others, as it is the least liable to defilement when cleaned by low caste servants. However, kansa or phul or Bharat vessels are prized for their fine whitish colour and also their strength and sheen. The alloy is also esteemed for its power of resisting the action of acids in food and drink; it is less liable to be tarnished and so is put to ornamental and higher uses. It is more sonorous than brass and is therefore admirably adapted for gongs and bells, the famous Burmese gongs being made of such alloys. Brass is used for all sorts of things whether prepared by casting or hammering; the sharpness of its castings can be increased by the slight addition of lead, while the hardness is varied by the addition of a little tin. It is this capacity to undergo a large variety of treatment which makes brass a very useful alloy.

SECTION II.

The Castes employed in the Copper and Brass Industry.

A study of the castes employed throws great light on the organisation of the industry and is instructive in showing several general tendencies perceived throughout the country. (1) The industry supports all castes of the people; in some provinces it includes the "whole range from the Brahmin to Bhangi," while in some the Hindus and Mahomedans co-operate in many important operations. This shows that the profits of the industry are fairly certain and lucrative, which with the general weakening of the caste principles testify to the germs of the

The General Tendencies of the Organisation of the Industry.

Industrial Awakening seen all round in India. (2) The large variety of castes employed permits of a division of labour which is so characteristic of the industry, specially in the longer centres. (3) The migration of copper and blacksmiths from the villages to the larger centres of the trade shows the tendency for the localisation of the industry, which has been necessary in present days of hard competition.

From the consideration of the division in the different provinces, the castes employed in the industry may be divided into two wide groups. Firstly, there is the capitalist class who invest their money in

Two great Classes: Capitalist and Workman.

the raw material and pay wages to a lower class of workers, which latter is generally subordinate to the former. The capitalist class is known by different names in the different provinces.—in the North they are called Kaseras or Kânsaris, while in the South they are named Kansârâs or Kâsârs. The other or the workmen class is named Thatheras or Tamerâs, or Tâmbats. This indicates mainly a distinction between the makers and the sellers of the utensils. Sometimes, as in small villages the two functions are combined, and in such a case the craftsman works as master, workman, producer and retailer all in one. It requires a fair amount of risk and work for the capitalist class to advance money in wages and to sell their products. Often they have to go out to the weekly fairs in the neighbouring cities or to the large religious fairs or have to send a cartload of vessels round the villages at the harvest time. In small towns, a single family helped by a few skilled or unskilled artisans supplies all the men necessary; by slow gradations the division of labour is so extended as to approach the Western methods. Thus in many of the large towns twenty or more men work under one rich capitalist who supplies them with tools and other requisites and pays their wages. This method is generally attended with a perfect division of labour, each man being responsible for only one part of the process for the manufacture of a single article. Thus in making an ordinary pot or vessel one man cuts the sheet into

Division of Labour in the large Towns.

proper pieces, another beats them roughly, a third man beats out the lower half of the vessel, a fourth man the upper half, a fifth man makes the dovetailed joints ready for soldering, a sixth does the soldering while there are different men for cleaning, polishing, and finishing the vessels. By this process each man is able to do his work in the most efficient and rapid manner; thus considerable saving in time is secured while improving the quality and uniformity of the goods turned out. The immense advantages that accrue from this system are directly responsible for the concentration of the industry in the larger centres of production. It does not pay the small producer in a village to make a few articles on the spot.

Depression in the Village Industry.

The smaller markets get their supplies from the towns almost entirely (except perhaps a few brass ornaments made by the village brass-smith who also repairs old vessels); consequently, although there is a rise in the industry as far as the large towns are concerned, it is not in a prosperous condition in the villages and the smaller towns. This has led to the migration of the brass and copper-smiths and to the interchange of the occupations of the different castes.

We will conclude this section with a description of the castes employed in the different provinces.

The Castes employed in.

In Bengal, all castes without distinction seem to have trespassed into the hereditary profession of the braziers, and are seen busy hammering copper, moulding brass, and polishing bronze, or selling the utensils as wholesale merchants, retail shopkeepers or wandering hawkers.

Bengal.

In Punjab and United Provinces, there are in most centres of manufacture two distinct bodies of men —the Kaseras or the Capitalist dealers (Mahajans) and the Thatheras who are more or less skilled artisans. The connection between these two classes is of varying degree of intimacy and in the extreme cases the latter are practically the slaves of

Punjab and U. P.

Relation between the Capitalists and the Workmen.

the former, who by a system of advances that are never paid off keep them in their power and prevent their disposing of their services to the highest bidder. The Kasera supplies the material and pays a fixed rate per seer of the finished goods. The Thathera does not on the whole seem to be badly remunerated, as he can easily make Rs. 20 to 30 per month. The profits of the Kasera on the ware that passes through his hands vary from $1\frac{1}{2}$ to 2 annas per rupee of prime cost. It is stated that this dependence of the artisan on the capitalist tends to discourage enterprise and militates against the artistic development of the manufacture.

The Kaseras of the Central Provinces (District Hoshangabad) place themselves on equality with the Brahmins. Their habits and mode of life, their system of bath and worship, the use of the sacred thread, avoidance of animal food and drink, suggest that they are not much below the Brahmins in their social scale ; in many cases the food prepared by the former is eaten by the latter.

Central Provinces : Kaseras, The Tamerars or the workers in copper and brass who generally beat out the vessels are not so respected as the Kaseras ; while the Otaris who form another section employed mainly in the casting processes, are still lower in the scale. However the distinction is not quite rigid as, as in other provinces, other castes or subcastes are also engaged in the industry.

Tamerars, and Otaris.

The Kāsārs of Nasik do the only business of selling brass and copper vessels wholesale or retail.

Nasik : Kāsārs. They are well-to-do generally and wear the sacred thread, but they eat animal food and drink liquor ; however they are generally sober and orderly. Tām̐bats are said to have come from the Panchmahals in Gujarat three or four hundred years ago, and seem to possess many things in common with the present copper-smiths found at Ahmedabad, Baroda, Surat or Bombay. The

Tām̐bats : connection with Gujarat.

Tāmbats of Nasik speak Gujarati at home and their women put on a modified Gujarati dress. Their work is restricted to the making of large vessels generally without carving but noted for the beauty of shape and polish. Besides

Kalaikars,

these, the Kalaikars or the Tinsmiths who are engaged in small vessels are not held in so good esteem as the Tāmbats. The Charakwalas of Nasik

Charakwalas,

correspond to and include some Thatheras of Northern India. They do the work of polishing on the lathe, generally make no pots, and are the servants of the Kāsārs. The Nasik industry shows the great attraction the trade had for people from distant parts like Gujarat and Northern India, who in expectation of a lucrative income have migrated to the place.

Poona,

The same description about the castes holds for the Poona workers in brass and copper ; while with a few changes it applies also to the copper and brasssmiths of Gujarat, at places like Bombay or Ahmedabad.

Bombay.

The total number of men supported by the industry in the important provinces and towns can be seen from the census figures quoted in the appendix. As may be expected from the limited centres of production, the distribution of the workers in these metals compared to the population works out to a small figure, *viz.*, about 13 workers* per 10,000 of population. However, this number varies from province to province. In Bombay Presidency there are about 60 men per ten thousand while in Bengal there are about 50 per ten thousand. The total number of men supported by this industry is nearly four lakhs, or more exactly 3,90,226. For further details, see Tables I and II below.

* See Census Report, 1901, Vol. I, p. 197.

TABLE I.

Total Workers in Brass, Copper, Bellmetal, and Aluminium in India (Census Reports, 1901, Vol. I-A, Pt II, p. 376).

	Total Supported	Workers Male.	Workers Female.
Brass foundries, owners, managers, and superior staff. }	1,696	569	127
Brass foundries, opera- tives and subordinates. }	3,396	1,237	61
Brass, Copper and Bell- metal workers. }	2,61,622	89,002	976
Brass, Copper and Bell- metal Sellers. }	1,23,258	40,227	4,654
Aluminium Workers and Sellers (Madras & Mysore only). }	254	100	...

Workers in Copper, Brass, Bellmetal according to Provinces.

Provinces.	Actual workers.	Partial agriculturists.	Population in thousands.
Bengal	35,347	2,511	74,744
Bombay	10,501	236	18,559
Burma	1,822	7	10,490
Central Provinces	7,745	127	9,876
Madras	21,164	892	38,209
Punjab	8,970	82	20,330
United Provinces	22,836	1,331	47,691
Baroda State	635	...	1,952
Hyderabad State	11,660	916	11,141
Kashmir State	570	25	2,905
Mysore State	2,655	101	5,539
Travancore State	2,180	22	2,952

Total Supported 390,226, out of 294,361,056

Total population of India, *i. e.*, workers in these metals are about 13 per 10,000 of population.

TABLE II.
Distribution of the Workers in the Large Cities of India.

	Bombay		Calcutta		Madras		Delhi		Lahore		Ahmedabad		Agra		Cawnpore		Allahabad		Amritsar		Lucknow	
	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.
Brass foundries Superior Staff.	...	...	6	32	...	...	...	...	3	17	...	...	...	...	...	...	...	...	...	...	...	...
Brass foundries Subordinates.	...	...	114	115	...	...	...	...	24	57	...	...	...	...	...	...	...	...	...	...	...	...
Brass & Copper Workers.	756	935	708	1073	323	747	1894	2748	71	248	157	356	47	89	296	525	87	91	343	282	67	352 ³³
Brass & Copper Sellers.	169	220	815	1139	247	509	375	1617	135	361	136	180	2	2	...	...	...	...	135	165	586	517
Aluminium Work- ers and Sellers.	...	...	...	...	90	136	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total.	925	1155	1643	2359	660	1392	2269	3365	233	683	293	536	49	91	296	525	87	91	478	447	653	869
Total popula- tion of the Town in thous- ands.	776	847	509	208	309	185	188	197	172	162	264											

W = Workers. D = Dependents.

W = Workers. D = Dependents.

SECTION III.

The Wages and the Profits of the Industry.

The wages of the experienced worker in copper or brass varies from eight annas per day to Rs. 3 per day, with all sorts of gradations. This amounts to a monthly income varying from Rs. 15 to Rs. 90 per month, though it must be noted that the higher limit is reached by a few only. The inexperienced labourer scarcely gets more than annas three to six per day.

The profits of Kaseras or the sellers of the ware varies from half anna to four annas per Rupee of prime cost, though it is unlimited in the case of artistic ware.

It must be pointed out that the above figures are very vague as they include averages for different provinces. As in other industries the wages differ very widely also with the different kinds of the work ; thus, for example, the hammerman, the fireman, the blower (for the fire), the man to hold the plate on the anvil, the makers of designs and moulds, the crucible-lifters, the finishers with lathe and chisel all perform their own specialised work and get different amounts of wages.

On the whole, the relations between the Workers and the Capitalist classes are of a fairly cordial type, and as the industry is yet on a domestic or workshop system there is little likelihood of its being disturbed by interval disunion of a serious kind.

SECTION IV.

The General Methods of Manufacture.

The method used in different parts of India for the manufacture of domestic utensils and other artistic ware may be generally divided into two main classes *viz.*, the Beating

and the Casting Processes. These methods are almost the same throughout the different provinces, the only difference being sometimes in the use of different instruments or raw materials to suit local conditions and requirements. Very scarcely any machinery is used by the ordinary brass and copper-smiths and the introduction of the methods of stamping out circles or sheets of metal into required shape by machinery is restricted to a few metal factories only, which again are not working satisfactorily.

In the beating process the metal is first beaten into sheets of required thinness and then hammered to the required shape. At present, generally the imported copper and brass sheets are directly cut and hammered into vessels of desired form; but often the sheets are made from ingots or old vessels of brass or even from the metals, copper and zinc, which are alloyed in the proper ratio by weight. Copper requires a high temperature (1996°F) to melt, so copper sheets are imported in preference to the ingots or bars. To make brass, the copper is first melted and then zinc (which fuses at only 773°F) is gradually introduced. Great care is not taken here in India in the making of brass, except perhaps in a few of the larger centres. A very high temperature has to be avoided, otherwise both copper and zinc volatilise and cause loss; again, zinc should be introduced immediately before pouring out; if allowed to remain long the metal volatilises and passes into the chimney. Of course zinc has to be added warm and free from moisture to avoid explosions.

The metal is generally fused in crucibles, made of clay and paddy husk and previously fired; in some of the larger centres graphite or metal crucibles are used. When the metal or the alloy is properly fused it is run out into shallow earthen dishes, the size of which varies with the amount of the charge. The dish is broken as soon as the metal has solidified and the metal while still hot is hammered into plates on an anvil. One man rotates the metal while three or four others alternately strike at it till a plate of required thinness

The Beating Process.

Suggestions.

Crucibles of clay and husk.

Hammering of the Plates.

is obtained. The plates are then cut into different forms for different kinds of vessels. These pieces are then worked out in several steps over different anvils of various shape and size. Sometimes smaller quantities of the alloy are forged into a single small plate which is at once beaten out into a small vessel like a dish.

As in the case of beating out the plate or the sheet, the transformation of the plate into a vessel is generally accompanied by a complete division of labour which perhaps could not be carried further. The upper

Making of the Vessel.

and lower parts of a vessel which are different in size and shape are beaten out by different workers; a different man makes dovetails at their ends ready for a joint; soldering is done by a still another man who spreads over the joint a mixture of equal parts of copper and zinc, fuses it and hammers it in. The cleaning, polishing and finishing are in the hands of different men. Generally these vessels are finished with a hammer which leaves a spotted appearance throughout the surface.

The Casting Process is somewhat similar to the beating process as far as the initial stage of the melting of the metal is concerned.

The Casting Process.

Different methods are used for different purposes and in different provinces, but the following is a fairly general description. The moulds are generally made of clay and

Moulds for solid Castings.

sometimes those for solid castings are of stone or iron. The latter generally consist of two parts; the lower frame is put on a board and filled with ordinary earth which is rammed down and made quite even, the upper frame is similarly treated and a small channel for the molten metal being left the two frames are clamped together. For hollow

Moulds for hollow castings.

castings, the moulds are made in different ways; a clay core is first prepared and then coated with wax or a similar mixture; the wax is then worked into proper design and shape and then coated with

fireclay, followed by another coating of a mixture of clay and paddy husk. When the mould is ready it is heated and the wax from the middle is let out from a hole. The two cores of the mould are sometimes supported by small splinters of wood or metal. Before use the moulds have to be heated gently so

Mould Furnace.

that they can withstand the contact with the hot metal, and for this purpose a mould furnace, of bricks coated with mud, with a rough framework of clay for resting them, is generally used. The metal or the alloy itself is heated in another furnace which is generally sunk a few feet below the surface and is

Crucible Furnace.

supplied with a pair of bellows for sending in a blast. There is also a lattice-patterned stage for resting the crucibles (made of clay and paddy husk) containing the metal or the alloy. Heating for about five hours is required for melting the alloy; the proper point of fusion is judged from the appearance of a peculiar greenish flame, when the moulds are brought from their furnace and kept ready for receiving the metal. In some cases, specially when

Pouring in Moulds.

the moulds are small the crucible and the mould are held together by a hollow clay joint and the metal is run in by simply inverting the crucible. After the metal is transferred to the moulds they are allowed to solidify and cool for four or five hours. The cast article is then taken out from the mould and is given to the filer who files off the inequalities of the surface and who beats

Finishing the Cast Article.

them into shape if necessary. The article has in many cases to be mended by soldering or putting in a small patch of the same metal before it is given to the polisher for final finishing.

In reviewing these two processes it may be said that the beating process is done better than the casting. Little improvement is necessary or possible in the beating process, beyond the utilisation of small hand machines instead of manual labour. The division of labour and the organisation of the industry have already

Review of the two Processes.

reached a point when the use of costly machinery and appliances is rather out of place, as already shown by the failure of many of the factories for making only brass and copper utensils. However in the casting process improvement is necessary except in a few places. In many cases, as many as 25 per cent. of the castings are imperfect and have to be rejected or mended by patching or soldering.

SECTION V.

The Industry in Different Provinces of India.

We will now take up a detailed description of the industry as it exists at present in different parts of India, restricting ourselves to the items of general importance within the limits of our subject. It would be difficult to prepare a useful list out of the large variety of the articles of copper and brass made in the chief centres of the trade. The most common articles to be seen in all shops of the metal vessel dealers throughout the country are the domestic utensils like lotas or pots, dishes, cups, bowls of various sizes and patterns, and the articles to be used in temples or places of worship, *i. e.*, Idols, Bells or Gongs, Lamps, Censers, saucers, Spoons, Cymbals, etc. The following quotation gives an idea of the industry in present times :—

“ Indian craftsmen show a large capacity in the utilisation of copper and brass and their alloys. In Burma, for example, images of a stupendous size are cast in brass by a small band of operators, whose appliances would seem to be absolutely inadequate, judged by European standards. In many parts of India, again, as in Rajputana chain bangles are moulded and sold for a few annas a pair which in Europe and in America could not be produced at many times the price charged. Between these extremes in magnitude and intricacy lies the range of domestic and sacred utensils for the production of which every village possesses its skilled coppersmiths. Ordinary domestic utensils are

A List of the common Articles made in the Industry.

The Domestic Utensils.

rarely ornamental, but their shapes are often extremely graceful. The articles most generally used by the Hindus is the *lota*, a globular melon-shaped vessel with an elegantly reflexed rim, which doubtless originated from the partially expanded flowers of the sacred lotus. The Mohammedans have given their vessel (*Tonti*) a spout, because the Korân ordains that a man should perform his ablutions in running water, and the falling of the water through the spout is considered to comply with this direction. The shapes of the *lota* and the *tonti* have given birth to widely different forms of domestic and

decorative metal work. Some of the
 Ornamental Ware.
 most beautiful and interesting copper and

brass wares of India are those directly required for ceremonial purposes, or which have been derived from the implements used at the temples. The following are the principal centres of ornamental copper and brass work: Kashmir, Nepal, Sikkim; Amritsar and Lahore (Punjab); Lucknow (copper) and Benares (brass) in United Provinces; Jaipur, Bikaner, Dholpur, Ujjain and Indore (in Rajputana and Central India); Poona, Bombay, Nasik, Bijapur, Baroda, and Kathiawar[?] in Bombay Presidency; Mysore, Madras, Madura, and Nellore in Southern India. The brass work of Jaipur, which is specially artistic takes the form of miniature and charmingly natural reproduction of bullocks, carts, and scenes from country life in general. The gongs and images of Burma are also well-known.^{??}

Taking the different places in the order just enumerated,
 the artistic work of Kashmir in the ex-

Kashmir.

treme North stands most prominent. Besides the usual articles of brass made for domestic purposes, unique and quaint patterns of ornamental ware, *e.g.*, candlesticks, lamps, vases, teapots, etc., are seen. Copper ware was once a great favourite but is now going down partly because the patterns are not very good, and partly because the metal tarnishes rapidly. Copper articles sent to England reach there

^o Imperial Gazetteer of India, Vol. III, p. 240.

quite black and, when cleaned by mineral acids, both the polish and the beauty of the article are lost. The engraved and raised

Lac and Tinned Work.

work of Kashmir is very beautiful. Lac

work on brass and copper is not very effective; but tinned work on copper is well done. "It is a Turkoman art introduced into Kashmir where it has attained great perfection. Tin is soldered on copper previously graven with a floral design, the sunken ground of which is then filled with a blackened composition of Lac. The raised patterns shine like frosted silver out of a groundwork of blackened foliated snow delicately traced." It partly resembles Moradabad work, but is infinitely superior to the latter in art and design. A large trade is done in old brass and copper goods in imitation of

Imitation of Yarkhand Work.

Ladakh, Thibetan, and Yarkhand patterns

and sold as such. These articles are made in the bazaars of Shrinagar and are buried in earth or otherwise dealt with to give them an appearance of antiquity, which the unwary purchaser buys as old Ladakh and Yarkhand goods. However, the genuine old Kashmiri patterns—Lhasa bowls, Yarkhand vase, Bokhara vase, Kashgar lotus, Aftāba, Kangri—are all very unique and truly oriental. It is a great pity that some

Effect of European Influences on Indian Art.

of the visitors ignoring true art give a catalogue of a European jeweller's firm to

the Kashmir artisan and ask him to copy the Queen Anne, the Windsor or Georgian pattern tea set. This mixture of oriental art and the occidental pattern is most unhappy, and disastrous in the interests of the Indian Art.*

The artwork of Punjab is not quite noteworthy. The chief

Punjab,

centres of copper, brass, and kausa work

are Rewari, Delhi, Panipat, Jagadhri, Amritsar, Pinddadankhan, Gujranwalla, Lahore, Umballa, Ludhiana, Jallundhar, and Peshawar seem to have attained some importance in recent times. At these places little work is done besides the manufacture of vessels for domestic use which are

* A. Mitra, Lahore Industrial Conference, 1909.

only roughly ornamental. All the brass, copper used is imported chiefly from Europe. Formerly copper used to be obtained from Kulu but this import has entirely ceased. Various copper and zinc ores found in the Kulu hills and other parts of the Himalayas used to be mined, but the imported metals are so cheap that there is no immediate likelihood of the mines being reopened. Both yellow and white brass (bellmetal) are manufactured in the Punjab. Brass ware is either hammered or cast; copper ware is either cast or made of sheets of copper bent and soldered together.

Indian Copper from Kulu.
Imports from United Provinces.

The vessels made in Punjab are inferior to those made at several places in United Provinces and consequently it has to import annually from the latter about 7000 maunds of brass ware and 8500 maunds of copper ware in excess of its exports.*

The chief centres of the trade in the United Provinces of United Provinces. Agra and Oudh are Benares, Muttra, Mirzapur, Moradabad, Lucknow and Farukhabad. The first three are the centres of the Hindu trade, while the last three places specialise in the ware required for the Mohammedans; out of these two groups Mirzapur and Farukhabad manufacture the articles of domestic use only. The other centres produce besides domestic utensils artistic ware, some of which is famous throughout India and even beyond. This fact permits of a little more space being devoted to these places.

Artistic Ware.

Benares work excluding the slight manufacture of household utensils is generally of the ornamental type, which latter may be divided into three main types:—

Benares work: three types.

- (1) Religious or sacrificial vessels, brass idols, brass and copper sacrificial implements, bells and gongs made of phul or bellmetal, brass doors and panels.

* See "Industrial Punjab" by A. Latifi.

- (2) The genuine Indian art ware, brass trays embossed with copper, Engraved work, Raised work, and some of the Benarasi lotas which are bought by the pilgrims to the place as souvenirs.
- (3) Articles manufactured for the European visitors, *e. g.*, paper knives, salvers, jardiniers, &c., which look rather unnatural by the strange mixture of eastern art on western patterns.

However the most common form of the industry is the manufacture of idols which are sold in the large bazaars attached to the big temples of the city. Sir George Birdwood compares some of the bazaars with the growth of several similar places in Jerusalem. "The industry has sprung up naturally from the numerous temples of the city and has connected the precincts of every temple into an ecclesiastical bazaar.

Comparison between Benares and Jerusalem. It was in this way that the seats of those who sold doves for the sacrifice and the tables of the bankers who exchanged unholy for holy coins were gradually intruded into the outer court of the Temple at Jerusalem; and that the 'booths of Bethany' rose beneath the green benches on the opposite slopes of the Mount of Olives. Miss Cumming, who has given a most graphic account of the temples and the temple services at Benares, says it is impossible to walk through the bazaars of this city without recalling the description of the vessels of the temple of Jerusalem: of 'the cauldron pots and bowls, the shovels, the snuffers, and the spoons, the censers, the basons, the lamps, the candlesticks and all manner of things made either of gold or bright brass, which might be continuously scoured. Here in the open sunlight are the stalls heaped with all sorts of brasswork for the use of the worshippers. Incense burners and curious spoons, basons, lamps, pots, and bowls, and a thousand other things of which we know neither the name nor the use, but which the owners were continually scouring until they gleamed in the sun'. Amid these busy, noisy shops stands the red sandstone temple of Durga, elaborately carved from the base to the pinnacle, and alive with

monkeys : and down the next street another dedicated to the same goddess is full of brilliant peacocks, while above all else rise the glittering dome of the great golden temple of Shiva which for miles around is the cynosure of the pilgrims proceeding towards the sacred city from every part of India. The narrow streets are full of beautiful white cows adorned with garlands of flowers and having the *Trisula* of Shiva stamped on their hind quarters.*

“The speciality of the *Mathura* district in the matter of copper and brass ware is the manufacture of small images of Hindu gods, and chiefly of the images of the infant Krishna. These are not made by the ordinary brasssmiths or the Thatheras, but by Sonars or (goldsmiths). The patterns are archaic and have certainly altered little since the beginning of the present century, when many of them were figured in Moore’s pantheon. Small bowls which by means of a siphon concealed within a cone rising from the centre of their brass, employ themselves when the liquid poured into them has reached a certain level, are made in several districts. The Mathura form of this toy is a brass bowl which under the name of *Basdev Katorâ* has a fairly general reputation amongst the pilgrims from all parts of India who visit the holy land of Brij. On the top of the cone appears Vasudev carrying the infant Krishna and the bowl empties itself when the water within it rises to the feet of the child. It will be remembered that immediately after Krishna’s birth Vasudev carried Krishna across the Jumna from Mathura to Gokul in order to save him from the Massacre of the Innocents which had been ordained by the Hindu Herod Krishna. The Jumna was in flood but, on the feet of the holy child touching them, the waters of the Jumna receded leaving for Vasudev a dry path across the river.”§

The Basdev Katorâ.

* Birdwood, “Industrial Arts of India.”

§ Dampier “Monograph on Copper and Brass Ware of N. W. Provinces”, p. 34.

Moradabad is famous for tinned and lacquered work.

Moradabad: Tinned Work.

Brass articles are plated with tin and the patterns are then engraved so that they show the brass ground. In place of tin, a coating of lac is now used more generally, the lac being black, blue, or red. Black lacquer work is generally the best, the blue and red being the cheaper and worthless forms; it is a pity that the latter are encouraged in these days as a result of the principle of small profits and quick returns. The

Lac work.

lacquered work is performed in the following way; a pattern is first traced on the vessel covered with lac and then engraved. The lac from the other parts is removed by heating; the lac is finally pushed into the engraved portions and the rest is cleaned and polished.

Lucknow was once a famous place for Mahomedan ornamental ware; but after Mutiny and after

Lucknow.

the annexation of Oudh, the industry is reported to have declined: there is practically no demand for its artistic goods among the Europeans. The articles made at Lucknow for local use are of good quality and include Khâsdâns, Pândâns, Badhnas, Senis, Deghchis, Patolas, &c.

Mirzapur is a great centre for the Manufacture of Hindu utensils in the province, lotas, thalis,

Mirzapur.

batuas, etc., forming the usual list. Farukhabad also produces strictly domestic articles generally used by the Mahomedans. Besides these big centres, smaller places like Jhansi and Lalitpur have a considerable trade in brass animals, while Hamirpur and Muttra have a fair trade in small images or idols of the Hindu gods.

Bengal cannot boast of good artistic work in brass to compare with that of Benares, Madura,

Bengal.

Jaipur or Tanjore. The following are the chief centres of the trade in copper and brass articles:—Burdwan and Midnapur (Kansha plates), Nuddia, Pampatti,

Chittagong ; Murshidabad, Malda, and Shahabad (Brass and Bellmetal) ; Chhota Nagpur (Brass and Pewter) ; Dacca and Mymensingh (Iron and Brass ware). At

Domestic vessels,

some of these places, besides the usual domestic utensils, brass toys and mirrors, idols of gods and goddesses, models of vegetables and fruits, and other artistic work is turned out.

Toys.

Besides these several brass foundries make a large variety of things, to meet the new wants created

Brassfoundries.

with the increase of wealth and love of luxury, among which may be mentioned locks, padlocks, hinges, chains, doorrings, handles, penracks, inkpots, scales and weights, fittings for harness and carriages and for scientific instruments.*

The Burmese do not use copper utensils and there are only

60 persons returned in the census returns

Burma.

as copper workers or sellers. Brass also is not widely used in Burma and is chiefly associated with religious acts. For these reasons "there is no copperware and nothing to correspond to the hammered *repousse* panels of the Punjab, the encrusted work of Tanjore or the quaint shapes and ornamentation found on the copper utensils of the Thibetan frontier. In brass too there is little wrought work strictly speaking, and it is difficult to associate ideas and artistic temperament with the heavy nature of the castings... The brass-work of Burma is bound up with the philosophy of Gautama Buddha and with the humble work-a-day life of the people. In

the forefront there is the cast and graven

Images of Buddha.

image of Gautama, seated calm and placid, and gazing from its dark niche beside the white pagoda, over the level plain to where the blueblack trees shut out all further view. The whole figure is a fitting symbol of Buddhism expressive of the unalterable, passionless, impersonal nature of the law of cause and effect. In pose it is self-contained, with no suggestion of past or future movement and, being roughly pyramidal in form, is in the position of most stable equilibrium.

*Mukkerji Monograph on the Copper and Brass ware of Bengal.

Seated crosslegged with the arms by its side and enfolded in a monk's robe there are none of distracting suggestions of the uncouth images of India, and this by no chance genius of the local artist ; throughout the country these images are the same in attitude, in expression, in all details as to the fall and number of folds to the garment, and in the conventional shape of the hands and feet."* Besides the cast images of Buddha which are familiar throughout the country, wrought brasswork does

Wrought Work.

not occupy an important place. Wrought brass work includes spittoons, limeboxes, the mouthpieces and the bellshaped ends of the trumpets, and cymbals. The bells in Burma are of two kinds, the heavy bells which are seen in the pagodas hung by contorted dragons to a crossbar which are struck, by those wishing to acquire merit with deer's antlers or bars of wood. There are also small triangular gongs with upcurved horns at the outside, lower corners. However on the whole the industry is in a backward condition in Burma.

Bells and Gongs.

The Central Provinces produce little artistic beyond what is immediately needed for the domestic purposes. Nagpur, Bhandara and Pauni are the chief centres in the Province where some of the artistic work in brass, bellmetal, pewter, and copper reaches a fair degree of excellence, *e. g.*, the inscribed and scroll work on lotas, hand-lamps, candlesticks, drinking cups, bells, fountains, etc. Other places of importance for the industry are Brahmapuri, Chanda, Chikhli and Maddar. Among the ordinary list of the articles are found pots and pans, bowls, dishes, and lotas for domestic use, the worshipping or sacrificial vessels, and ornamental ware for women, *e. g.*, Bangles, Rings, Earrings, musical instruments, *e. g.*, the Ramtulas, and Turbis which are

Central Provinces.

Artistic Work.

Domestic Articles.

Ornaments.

*" Monograph on the Brass and Copper Wares of Burma, " by H. L. Tilly.

made either of copper or brass and chains, etc., for cattle. The artistic and ornamental patterns show inscribed and scroll work some of which is very effective. A common example is a lota, the upper and lower portions of which consist of inscribed brass, while at the centre is a ring of burnished copper of varying breadth, the effect being particularly pleasing. Lamps also of graceful shape and charming workmanship are turned out but only when specially ordered. Patterns of any description are wonderfully well copied, but the capacity for original design is seldom seen. A tendency is observed to deteriorate the quality of the locally made brass by the addition of more zinc, which makes the alloy cheaper and more easily worked.

Madras Presidency enjoys a good position in the production of copper and brass articles of artistic design, the ornamental work of Madras, Tanjore, Nellore and Vizagapattam being considered the best of its type in India. Among other countries may be mentioned Maddagiri, Nagamangala, Karatgiri, Magadi, Belur, Tagari, and Sravan. "The manufacture of fine ornamental and bronze work in the shape of many-branched lamps, sacrificial utensils, images, etc., for which Southern India was once famous has become an extinct art..... The collection in the Madras Museum from Vizagapattam of little brass figures riding on horses, camels, elephants, etc., which for skilful modelling, finish, and a certain irresistible grotesqueness of expression are, as Sir George Birdwood writes, the finest he has ever seen."

Tanjore Work. "Tanjore is now the chief centre for metal work and the three main varieties made there consist of combinations of copper and silver, and of brass and copper, and graven brass. The incrusting of copper with silver is a modern adaptation of an old art and the demand for these wares is almost entirely European. The figures on trays, vases, and caskets are taken from the Hindu Pantheon, and the floral decoration is conventional. Brass trays and plates into which thin plates of copper are let in or damascened.

with crude representations of gods are made at Tirupati. The pilgrims who resort to the local temple support the industry. There is also a small trade in brass and copper deities of local manufacture. At Nellore exists an industry in pierced brass trays engraved with mythological figures. An interesting type of brass work is carried on at Belaguntha and other places in Ganjam, in the form of grotesque animals and human figurines cast by *cire per due* process, which are said to be used as wedding presents by the hill tribes of the Khutiā Khonds.

Madura.

At Madura, brass models of lizards, the praying monks, cobras, frogs and other animals are made, well executed samples of the industry are obtainable on special orders. At Kurumbalur in Trichinopoly district there is an interesting industry in the manufacture of brass toys and vessels inlaid with zinc. The temple bells of India are celebrated for the depth and purity of their note and those of Madras are distinguished above all others by their stately architectural forms; the handles are generally crowned with a group of puranic gods sculptured in full relief." * Travancore has a flourishing brass and copper industry.

Kurumbalur.

Almost all the household vessels in high class or middle class Hindu families are of brass, copper or bell-metal. "In Travancore bellmetal cauldrons and copper cooking pots are made on a colossal scale, as they are in great demand for the feeding houses attached to the temples. Some of these in use at Trivendram feed 5000 persons at a time and are so deep that a boy can conveniently swim in them if filled with water." †

Zinc-laid Articles.

Travancore.

The chief centres of brass and copper manufacture in the Bombay Presidency are Nasik, Poona, Ahmedabad, Bombay and Jaipur. Besides these there are several places of minor importance which

The chief centres of brass and copper manufacture in the Bombay Presidency are Nasik, Poona, Ahmedabad, Bombay and Jaipur. Besides these there are several places of minor importance which

*Imperial Gazetteer of India, Madras, Vol. I, p. 65.

†Nagmaiah, "Industries of Travancore," Madras Industrial Conference.

specialise in a few articles, *e. g.*, Jamnagar, Limbdi in Kathiawar for Nutcrackers, &c., Patan, Jambusar, Amod, Baroda, Ajmere, &c. Sir George Birdwood writing of the artistic and ornamental work in the Bombay Presidency gives the first place to Ahmedabad. "In the Bombay Presidency Ahmedabad, Nasik and Poona have always been famous for their copper and brass work. Besides the ordinary

Ahmedabad.

pots and cups the braziers of Ahmedabad make very graceful and delicately cut brass screens (possibly derived originally from the beautiful brass gates at Shah Alum's Tomb) and *pāndāns* for holding betel leaf (*pān*), small boxes of very graceful form covered with the most delicate tracery and known to Europeans as spice boxes. Their wares belong to two chief classes: the first of copper, domestic pots, jewelry-caskets, and ink stands; the second of brass, sweetmeat boxes, spice boxes (*pāndāns*, &c.), rings, lamps, idols, and chains. They make their own brass in the proportion of 4 parts of copper to 3 of zinc. A good deal of iron work is also done at Ahmedabad. There is a large manufacture of idols in all metals at Nasik and at Poona. Good

Nasik.

brass utensils are also made at Kelshe and at Bagmandi in the Ratnagiri Collectorate. Bells for bullocks are a speciality of Sirsangi in the extreme eastern limits of Parasgad in the Belgaum Collectorate. The most active industry in the town of Bombay is

Bombay.

the manufacture of brass and copper pots and other utensils in universal use among the natives of India. The copper bazaar opposite the Mumbadevi tank is the busiest and the noisiest and one of the most delightful streets in the native town."*

The industry of Ahmedabad in copper and brass in Ahmedabad is much changed since Sir George Birdwood wrote the above in the eighties of the last century. The artistic ware of this place is no more

Ahmedabad Work.

* Sir George Birdwood, "Industrial Arts of India," Vol. II, p. 160.

so prominent, though the industry of making domestic utensils is a fairly prosperous one, and has undergone considerable expansion in recent years. The quantity of brass made in Ahmedabad has appreciably diminished on account of the cheapness of the imported product in a form suitable for ready working up into utensils. Both copper and brass sheets are brought from Bombay by regular wholesale dealers, who are generally Mahomedans of the Shia or Dandi Bohra sect, and who sell them retail to the respective coppersmiths. Though the principle of working in large batches is followed in this city as in others, there is not sufficient combination among coppersmiths to enable them to buy their wholesale lots themselves and to save the profits of the middleman. The industry is not in the hands of the regular caste of the coppersmiths, alone, but as in other places the workmen are derived from different castes among whom the Lohars or the blacksmiths are the most prominent.

The brassware of Nasik is held to be very superior in make and polish: all of this is generally made

Nasik Industry.

from the sheets of copper and brass imported from Bombay. A little brass and bellmetal is smelted by the Tambats in Nasik, and some of the copper used is made

Making of the Vessels.

from old and broken pots. The alloy or the metal is generally fused in crucibles put in the furnace, which is a pit. The wrought vessels are generally made of two pieces, one upper and one lower, separately beaten into shape and soldered with brass, borax (or savagi), and navasagar (or salammoniac). There is generally a division of labour, bands of five or six men engaged upon the same vessel. The tambats do

Division of Labour.

not give much polishing beyond a rough scrubbing with a mixture of powdered charcoal and tamarind pulp, followed by beating with a small hammer till the whole surface of the vessel is covered with little facets. The polishers or the charakwallas are all hired servants; they fix the pot to the lathe and scrape with a small tool called *Randha*. The

Tambats and Kalaikars are like Charakwad ellas the hirservants of the Kāsārs. They are supplied with the metal and are paid for working large copper and brass vessels at the rate of Re. $\frac{1}{4}$ per maund and for small articles Re. 1 per pound.* The wage for casting is paid according to the size and shape of the article made. In Nasik, as there is no lack of work, the Tambats are well off, being generally well-housed and well-fed. The Kalai-kars, though poorer, have regular work and are by no means badly off, as most of them are free from debts; their work does not extend to more than nine hours per day. Nasik brassware is in good demand not only in the local markets but even as far as Gujarat, the Nizam's

Demand for the Nasik Ware.

territories and the Central Provinces. The trade is almost entirely carried on by the Kāsārs who either get orders from dealers in Bombay and other chief trade centres, or send their agents, or themselves go, with a cart or laden bullock or pony to smaller weekly markets or to the Maheji fair in Khandesh, and dispose of them to the village shopkeepers or to well-to-do husbandmen. In this way a bulk of the unpolished product made by the Tambats finds a market.

But the chief growing demand in Nasik itself is from pilgrims, almost all of whom take away some things of the graceful and highly polished smaller brassware.

The copper and brass industry of *Poona* is progressive. Besides the Kāsārs and Tāmbats who are directly connected with the selling and the making of the brass vessels, other castes like the Jingers, Otaris, and the Kunbis also work in the same metals. The details of manufacture and other industrial conditions are quite identical with those available at Nasik and so a description of these is unnecessary. The Jingers mostly do the finer kinds of brasswork, *e. g.*, making false jewelry, gilding clocks, turning metal, casting and polishing goods, making locks, sharpening swords and knives. The Kunbis who have recently taken to

Poona.

* Bombay District Gazetteers, Nasik, Vol. XVI, p. 146-149.

brasswork are of two types, the Ghadnars or beaters, and the Otnars or casters. The work of these

Kunbi Workers.

Kunbi coppersmiths appears to be of entirely a subsidiary character. They use the old pieces of brass or copper left by the Tambats, the remains of copper sheets punched at the mint or the cartridge factories and the old broken pots. For melting their alloy they use iron cups instead of clay crucibles used by others ; and as the cups are eaten up, they require four such pots for every 250 seers of brass smelted.

The articles of copper and brass made at Poona may be arranged under 14 groups ; those used in the kitchen, those used in storing and carrying water, articles used in serving betel, musical instruments, measures, lamps, dishes and vessels used in worship, images, peasant jewelry, toilet requisites, appliances used in the dining hall but not for drinking or eating, miscellaneous ware and toys. "Poona brassmaking came originally from Ahmednagar, all of the coppersmiths from the latter place have now moved to Poona. Pen and Revdanda in Kolaba which used to make considerable quantity of ware are almost entirely without work. Chandor is declining, and though the practice of pilgrims bringing away

Competition between Poona and Nasik.

Nasik brassware will probably serve to keep up the demand at least for the higher class of articles made at Nasik, unless they change their system the whole of the Nasik trade in ordinary cooking and drinking vessels will pass to Poona. The Poona coppersmiths are able to undersell their rivals by adopting the union of combination among the workers and separation among the articles made is the cent of cheap production. The cooking and watervessels are all made of one size and of one shape. And in making it each vessel is passed through a succession of groups of workmen whose whole attention is given to perform one stage of the work quickly and thoroughly." The ease with which Poona trade in ordinary vessels is able to crush down that of smaller centres shows the general effects of increased efficiency,

due to better organisation of the industry, and to more specialised division of work.

Bombay is perhaps the largest centre in India of the copper and brass manufacture. "Bombay and Ahmedabad produce large quantities of copper and brass vessels which are sent to almost every part of western India."* The work of the Bombay craftsman is described to consist of household utensils, lamps, chattis of all shapes and sizes, and water-pots and *lotas* of all descriptions. They are all more or less roughly turned out and devoid of any exterior ornamentation, their only claim to notice being the shape of some, and the colour of the metals and the sheen given by the work of the hammer. The copper bazaar opposite Mumbadevi tank is the busiest and noisiest street in the city. There are about 4,000 brass-workers and coppersmiths, and 5,000 blacksmiths in Bombay."§ Besides at the Mumbadevi, much of the work of manufacturing the vessels is done at a small street near Kandewadi in Girgaum where the noise of unceasing hammering can be always heard from morn to eve. Some of the workers in Bombay also make vessels out of imported German silver sheets, and these are being often preferred to brass specially among the richer class. In Bombay another kind of substitution of the brass vessels is seen and this is by the growing popularity of tinned ware among the poor people. The industry of making vessels out of tinned iron from old kerosene tins is growing under the tactful Bohras; while the great need of cheaper substitute for brass and copper vessels has given employment to blacksmiths who make the larger vessels out of tinned or galvanised iron, and to several of the metal factories. The factories find that there is little margin of profit in the making of brass vessels, so they make either German silver or Aluminium vessels, or prepare some of the tinned and galvanised ware required for carrying or storing water. In spite

* See Bombay Gazetteers, Poona, Vol. XV, pp. 170-174 for a complete list of these articles.

§ Imperial Gazetteer, Vol. VIII, p. 325.

of the process of substitution the Bombay industry in brass and copper is thriving, mainly for two reasons: The raw product (the sheets of copper or brass) is the cheapest compared to other centres removed from the sea; and there is a ready market for these goods in the expanding city. Moreover, the industry is helped by the immigration of the better class of workers from the districts.

A very interesting place in connection with the brass industry in Bombay Presidency is Jaipur.

Jaipur Industry.

The art work of this city is praised on all sides and is perhaps superior to Tanjore or Benares work.

visit to the city of Jaipur shows what can be done in the cause of an industry by state protection. The excellence of the

manufacture is maintained by the attention given to the same

in the local school of art. The artistic

tendencies of the craftsman are cultivated

and replenished by the state patronisation of the industry in the

use of the brass ware, whenever possible. As a result of this,

one is delighted to see all sorts of artistic work in shining brass

forming a part of the ordinary furniture in the state buildings

The pendants, burners, tubes and cocks for gaslamps, knobs

and handles for doors are all locally made in beautiful designs.

The state protection appears to be so thoroughly insisted that

the jugs, basins, dishes, pots, spittoons and other articles in

the State Hospital, which one might expect in other places to

be made of porcelain or enamelled ware, are made of glittering

brass in exactly the same shape as seen elsewhere. These

brass articles are kept clean perhaps more easily than the

imported earthen ware and are decidedly cheaper in the long run.

It is no vain hope to expect a similar improvement in the

industry if the methods of Jaipur are intelligently followed in

other places.

SECTION VI.

General State of the Industry.

It might be said in general that the industry is one of the very few in the country that have nothing to complain against foreign competition. Of course, the raw materials copper, zinc, and brass in the

No direct Foreign Competition.

form of ingots or sheets have to be imported but no brass or copper ware of the type prepared by the Indian workers is set in hostile array by the foreign manufacturer. The reason for this state of affairs is plain. The character of the goods is so specialised and varying with different provinces that it is impossible for a European factory to turn out these things in machines in uniform lots. Specialisation of work and division of labour are also carried out in most of

Specialisation of Work in the larger Centres.

the large centres, though some improvement may be needed in the smaller centres of production. No machinery is generally used, but a single article passes through the hands of half a dozen or more persons, each of whom knows his part of the work completely well and concentrates his energy on the production of his part to the state of perfection; the result is general uniformity and excellence of the work. Moreover the

Value of old Vessels.

local manufacturer besides making new vessels is always ready to repair or patch up a broken vessel and also to pay a fair price or barter for a new one when it is no longer of any use. This is a factor of economic importance which enables the people to prefer brass and copper utensils in preference to porcelain or enamelled or even aluminium ones, as the former bring something when out of use or can be repaired when broken, while the latter are entirely useless after a hole or crack has once been formed.

During the last 30 or 40 years the use of brass and copper may be said to have increased among the rural classes, on account of the rise in the standard of comfort after the opening of the railways. This

Increased Use of Brass and Copper Vessels.

was helped by a lowering of the price* of copper on account of cheapening of the metallurgical processes, and of the lower freights by competition among the different shipping companies.

Another reason for the prosperity of this industry lies in the great dislike the people, specially the Hindus, have against the use of earthen vessels. This was already pointed out in connection with the popular and religious prejudices in Section II, and has resulted in the exclusion of porcelain and enamel from among the orthodox classes.

Though the industry seems to be a fairly flourishing one, there is a black cloud on the horizon in the form of the continued rise in the price of copper almost amounting to 25 per cent within the last two years. Perhaps this was due to speculation for a time but the increased demand in India for electric traction and lighting is responsible in no small degree for the rise. As a result of the high price of copper, it has undergone substitution in various ways. The Mahomedans who religious point of view prefer to use tinned copper vessels have to resort to vessels of alloys like brass and bellmetal, and as there is a corresponding increase in the price of brass too, the imported§ enamelled ware has found a firm footing among the Mahomedans and the lower castes of the Hindus. The substitution

Increased Prices of Copper during the last decade.

Substitution by Tinned, Galvanised, Enamelled Iron; by Aluminium. is carried on to a much greater extent in the case of the large vessels which formerly used to be made of copper or brass are now made from old kerosene tins or galvanised iron sheets, specially for the purposes of holding and storing water. For smaller vessels aluminium is rapidly coming to the forefront, and is preferred on account of its lightness, and cheapness for bulk, while it can resist the action of vegetables and so saves the trouble and expense of tinning. It is difficult to say whether if the process is allowed to work it will be an economic loss to the country as all metals are imported; but it is certain that it will be a very

*See Index figures in Appendix, Table IV.

§See Introduction, pp. 5-6.

difficult task, and will take a long time, to displace the copper and brass industry completely.

Another general feature to be noted in this connection is the rise and localisation of the industries in the large centres with a corresponding fall in small towns and villages. The products of the villages are ousted by cheaper importations from the larger centres where more efficient methods have reduced the cost of production; such importation has been facilitated by the railways and the improved means of communication. The complaints that one sometimes hears in the larger centres about the depression in the industry are sometimes superficial. It is true that the profits of the individual manufacture have fallen on account of the breaking up of the monopoly, by the simplification of the methods of production. The cheap importation of sheets of copper and brass has done away with the costly furnaces or fusing appliances necessary for the making of brass. But, on the whole, the aggregate profits of the industry at a particular place, as judged by the total production, and the total increase in value after manufacture, have risen, and a larger number of workmen as well as more capital are employed now.

The general statements made above may be corroborated by detailed reports from different provinces of India.

“ In England many of the large industries have become concentrated in certain localities which for this reason or that have an advantage over all other places; and a similar process is going on in the Punjab due chiefly to the introduction and extension of the railway and to the general improvement in communications. Ever since the Annexation the scattered forges and bhattis of village brass and coppersmiths have been gradually disappearing and the corresponding population of the centres of the industry has increased and in many towns too the manufacture is languishing. The Multan factories for instance seem to be barely holding their own against external competition and it is

most probable that they will disappear one by one until only the minimum number necessary for repairing and petty work remain. Again, in spite of the great increase in the population of Rawalpindi City and cantonment during the last twenty years, the industry is by no means thriving, and in Lahore the manufacture is decreasing and the import increasing. The most hopeful places seem to be Rewari, Delhi, Panipat, Jagadhri, Hoshiarpur, Amritsar, and Gujranwalla for copper, brass, and kansu work and Peshawar for copper ware. It seems likely that at these places the manufacture will increase at the expense of the rest of the Punjab and that it will hold its own indefinitely against the N. W. Provinces and Kashmir factories except for the peculiar articles for which the latter are already famous.”* However, the hope has not been entirely fulfilled and the localisation of the industry is not limited by geographical or political boundaries. Since the above was written, Mr. Latifi§ has reported that “Punjab imports annually about 7,000 and 8,500 Maunds more of brass and copper ware respectively than it exports; the imports consist of hand-made articles chiefly from the United Provinces, preferred for their superior art and finish”.

The domestic and art ware of United Provinces is therefore
United Provinces.
decidedly superior to those of Punjab and the adjacent provinces. Besides the ordinary and the artistic ware of the province already noticed, several factories and foundries on modern lines are also engaged in the industry. The Aligarh postal workshop is doing good work in various kinds of brass articles like padlocks etc. While the engineering workshops at Lucknow, Jhansi, and Gorakhpur also do some work of this character.†

In Bengal also, “the manufacture of copper, brass and
Bengal.
bronze utensils is perhaps the only industry which has not suffered from foreign competition or machine made articles. Several attempts were

* Johnstone, Monograph on the copper and brass ware of the Punjab 1888.

§ “Industrial Punjab” by Mr. A. Latifi, 1912.

† See A. C. Chatterji's Note on the Industries of United Provinces.

made to turn out such articles by the aid of machinery, but they have not yet succeeded. The industry all over the country may be said to be a prosperous one. Almost every town of note has its braziers to make the articles, and the shops where these are sold. Besides, hawkers go from village to village exchanging new vessels for the old or selling bright utensils for cash. Owing to the greater purchasing power[?] placed in the hands of the people by the expansion of the export trade in agricultural produce, every household now possesses more utensils than it did in former times and a larger assortment of such articles is now presented to the bridegroom on the occasion of every marriage, which the bride's father has to do in compliance with ancient custom. The industry is, therefore, a thriving one and there is no sign of its receiving any kind of check in the immediate future. Although porcelain dishes and cups are gradually coming into fashion and enamelled ware has appeared in the market, the use of such articles is extremely limited and does not seem to have made the slightest impression upon the present prosperous condition of the brass and bronze industry".*

The industry is favourably reported also from the Central Provinces. "The gradual opening up of the Provinces to the network of railways has raised the standard of comfort among the rural classes by giving them a better market for their agricultural produce. The demand for the products of the brass and coppersmiths has thus increased and at the same time the decreased cost of carriage has tended to specialise the industry to certain districts or portions of districts that possess special advantages in production." On this account though the industry in villages has undergone depression, some of the centres like Nagpur, and Bandhana are flourishing.

* Mukkerji. Monograph on the Brass and Copper Ware of Bengal, 1894.

From the account already given of the industry at various centres in Bombay Presidency, it will be clear that the industry is in a flourishing condition. As in other provinces the tendency for localisation and centralisation is irresistible. Thus the village brasssmiths complain of the market being flooded by cheaper vessels from the large towns. Even among the large centres like Nasik and Poona the competition for superiority seems to be decided by better methods of working on large scale. Besides the production of articles of domestic and artistic type, a considerable amount of work in brass casting etc. is done in connection with the large number of workshops attached

Brass Foundries.

to the cotton and other factories. Several workshops (like Nannu's Brass Works) in the city of Bombay are run privately for the manufacture of articles of Brass to compete with foreign articles (*e. g.* bedsteads, locks, &c.) and the nature of the work turned out is quite creditable. The only difficulty is that they cost a little more than the imported articles, being made in small quantities.

Factories for Brass Ware.

The several factories for moulding and stamping copper and brass vessels have not thrived in competition with the old industry. The reason is that the vessels made by machinery are unpopular, as they are thinner than those beaten out by hand, and so do not stand the daily rubbing and scrubbing. A second fact to be noted is that the profits of the industry have been kept low by competition and efficiency of work among the workers by manual labour, and so the use of costly machinery for this purpose does not pay even for the interest of the capital invested nor for the wear and tear. Consequently many of factories started for working in copper and brass have preferred to work in other metals like German Silver and Aluminium or even Tinned iron. Thus it would seem that, on the whole, the present industry of making copper and brass ware is fairly prosperous and sufficiently well organised to withstand competition.

In spite of the general report of favourable kind on the manufacture of ordinary ware, it must be mentioned that the ornamental and artistic ware is degenerating. Though perhaps the demand for this has not much decreased but on account of the pressure of work in these harder times of competition and cheap prices and for lack of true and correct appreciation of Indian artistic ware, the quality of the work at present is distinctly inferior. This may also be an effect of the interference in direct art education of the people who already possess the tradition of a system of decoration founded on perfect principles, which they have learnt through centuries of practice to apply with unerring truth.

But putting aside the question of direct art education, it cannot be said that

Western influences has indirectly had a favourable influence on Indian art. The ordinary western public is not sufficiently well educated in the principles of Indian art to be able to distinguish between really good or merely showy patterns and provided it gets its money worth of gods, wild beasts, and jungle is generally content. The Indian artificer must cater for his market, and as the demand is brisk, cares little whether the pattern he turns out is of poor design and worse execution. In dealing with Benares and Moradabad work mention had already been made of the unhappy transference of native decorative patterns to articles of purely European design and use. This kind of work will probably increase with the growing popularisation of English habits among natives. The present may be merely a period of transition and pure Indian art may yet see a revival, but there is no doubt that the market of to-day is unable to call forth from the modern Indian handicraftsman the same quality of design and workmanship that his father displayed, when the workman lived at his master's house and wrought his craft stimulated alternately by fear of the lash and hope of large reward."* It is difficult to exactly gauge the causes that have

*Dampier, Monograph on Copper and Brass Ware of N. W. Provinces and Oudh, p. 36.

led to this fall in brass and copper artistic ware, which has been experienced in other places also. However the most efficient means of reviving this art would be to introduce teaching facilities for this art in the Art Schools of the large towns, and to start small art schools for the same purpose in those centres of the trade where such schools are not already existing. The example of Jaipur State was already pointed out as showing what could be done in the cause of the industry by systematic and considerate help from the State.

SECTION VII.

Raw Materials for the Industry and their Sources.

Though at present all the copper and brass used in India are imported, there was a time when the Old working in Copper Mines. Indian Industry was self-sufficient. Copper mining and brass making were practised in various parts of India. Signs of old workings in the Copper mines are found in Rajputana, in Kashmir, Narnaul in Patiala, and in Kulu, Kamaon, and Sikkim in the Himalayan hills. It is not definitely known when the working of these mines had stopped; but the exhaustion of the better ores, and the importation of cheap copper from Europe helped by low freights must have been among the causes that led to abandonment of the working of the mines.

All the Copper required in India is imported mainly from the United Kingdom and Germany in Imports. various forms, as ore in very small quantities, as old copper for remanufacture, as unwrought copper in the form of Tiles, Bricks, Bakes, and ingots, and as wrought copper in the form of braziers sheets 'lametta' and mixed of yellow metal. The value of the annual imports varies from Rs.2 to 30 lakhs with the price and with the prosperity in the country. The statistics of imports, exports, and provincial distribution are given below:—

		IMPORTS.		EXPORTS.	
		Cwt.	£.	Cwt.	£.
1907-08		315,288	1,375,640	1907-08	8,379 38,343
1908-09		496,405	1,814,245	1908-09	2,044 9,303
1909-10		506,599	1,762,304	1909-10	2,036 9,092
1910-11		732,914	2,473,078	1910-11	2,906 12,474
Average	1903-1907-08	...	1,374,378	1911-12	...
	1911-12	...	1,853,060	...	70,419

Provincial Distribution of the trade in 1910-11.

		IMPORTS.	EXPORTS.	IMPORTS..
		Cwt.	Cwt.	Cwt.
		From United King-		
Bengal	169,290	982	dom.	417,534
E. B. Assam.	2	...	Germany	193,774
Bombay	469,291	1,415	France	24,693
Sind	11,941	10	China	87,843
Madras	77,896	1		
Burma	4,494	2		

It will be seen that Bombay imports the largest amount 469 thousand cwt. out of a total 732 thousand cwt.; Bengal follows next with 169 thousand cwt.; Madras is next with 77 thousand cwt. It should be noted however that these figures do not indicate the amount of copper worked up by the respective provinces. For example, much of the copper imported by Bombay is only for distribution to Central India, Rajputana, United Provinces, and even Punjab. The same also holds good for the

Imports and Exports of BRASS.

	IMPORTS.		EXPORTS.	
	Cwt.	£.	Cwt.	£.
1907-08	21,736	86,436	3,114	18,913
1908-09	24,579	89,171	2,111	3,592
1909-10	16,799	62,224	1,975	13,323
1910-11	18,594	70,099	2,440	15,202

Provincial Distribution of the Import and Export trade in 1910.

	IMPORTS.	EXPORTS.
	Cwt.	Cwt.
Bengal	4,790	651
East Bengal and Assam	1,438	0
Bombay	7,455	1,726
Sind	1,075	16
Madras	879	27
Burma	2,957	20

Share of different countries in the Imports of 1910-11.

United Kingdom	10,604
Strait Settlements	1,391
Germany	1,642
Italy	1,867

Wholesale prices of Imported Copper at Calcutta during a period of 40 years:—

1873	100 (as standard)
1861-65	99
1866-70	85
1871-75	94
1876-80	86
1881-85	76
1886-1890	72
1891-95	76
1896	82
1897	81
1898	82
1899	95
1900	110
1901	111
1902	97
1903	92

Import Trade of Bengal.

It was already pointed out that the price of copper is steadily increasing. The price of copper in 1883 at Nasik (as reported in the District Gazetteer) was Rs. 44 to 45 per cwt. The price of copper in Bombay in July 1912 is Rs. 68 per cwt. The price of brass also has undergone a corresponding change; it used to cost in 1883 at Nasik Rs. 34 to 35 per cwt. : in Bombay the price now is Rs. 54 per cwt. The effect of high prices on the industry and the substitution of enamelled ware have been already referred to.

The brass used in India is also imported generally in two forms wrought and unwrought. Some brass is made now in India by the brass-smiths on the spot, as it used to be, but the quantity so made is small. At the present high price of copper and with the difficulty of melting copper, it is cheaper for them to import brass ready made in the form of sheets. However, when brass of special quality is required it pays the copper-smith to prepare his own brass. For this purpose old copper-plates, or broken or disused copper vessels, copper shavings, and the refuse of the scrapes of the metal from the mints or the cartridge factories, are used. The copper is first melted and zinc is then added in the required quantity of the preparation of brass of the particular quality. The old or broken vessels of copper are easily made available by the fact that they are never thrown away but stored till sold to the itinerant dealers or hawkers of brass ware, or bartered for new vessels to the manufacturer. The figures for imports and exports are given in the Appendix, from which it can be seen that the quantity of brass imported is nearly 20 thousand cwt. annually its value being about 12 lakhs of rupees. Bombay does the largest amount of trade in both imports and exports, while Bengal stands second.

Sources of Brass : Foreign
or Indian.

Foreign imports,

There are several other alloys of copper in use also. Brass in general contains 4 : 3 or 2 : 1 of copper to zinc. Bharat or Kansa is another alloy containing the two metals in equal proportions with a slight admixture of bad. This metal corresponds to what is called Princes' metal, and being more easily workable and cheaper is used for casting cheap ornaments, cheap pots etc. Phul or Bell-metal (Kansa) contains tin instead of zinc the proportion of the copper and tin being about 7 : 2. Phul is a little more costly than brass but is preferred for ornamental ware hukka-stands, and some domestic articles ; its use is precluded by the fact that it costs about one and a half times as much as brass. This alloy has been replaced to a certain extent by German silver which contains copper, nickel and zinc with traces of lead and tin. This is valued on account of its colour and polish though it is more costly than brass.

Zinc, therefore, is an important element besides copper in all these alloys and as such is imported in fairly large amounts. Zinc was known to the Hindus since a very long time, itself and its compounds being frequently used in medicine. According to some authorities the knowledge of the metallurgy of zinc was transferred from India to other countries. At present little zinc is prepared in India and so a great bulk has to be imported. There is not the least doubt, however, that upto less than a century ago zinc was extracted from the carbonate (smithsonite) at Jawar or Zawar in Udepur State in Rajputana.

The value of the zinc imported amounts to nearly 20 lakhs of Rs. (in 1907 it was £111,000) while the quantity is still larger if we take into account the zinc that is sent as brass or German silver the total swells to about 34 lakhs. The figures for the average imports (after deducting exports) for the five years 1903-1908 are as follows :—

Zinc as metal	£ 131,569.
Zinc as brass	£ 48,056.
Zinc as German silver	£ 127,447.

The other materials required in the industry, are the fluxes and the solders. These include
The fluxes and the Solders.
 common salt, borax (sohag or tinkal) soda (sajji), salammoniac (Navshadar or Navshagar), Alum and Mercuric chloride (Rav-Kapur). The addition of the last three is thought to improve the colour of the metal or the alloy. It is a considerable advantage to the country that many of these things are made in some part or other of India.

The solders used are of a large variety and the composition varies throughout the country. For copper
Solders.
 vessels a solder containing 4 parts of copper to one of tin is used; while for Phul or bellmetal vessels the solder contains 7 parts of this alloy to 1 of pewter; a solder in general use for brass and other vessels contains equal parts of copper and zinc. This is ground into powder and moistened to form a paste: in this form it is lightly spread over the joints and then fused and hammered in.

Having seen the wants of and industry and their supply by foreign imports, let us see how far it is possible to reduce the imports by manufacture on spot.

As far as is known at present, the ores of zinc are not at all common in India; they have been
Extraction of Zinc in India.
 found associated with the antimony ores near the Shigri glacier in Lahawal, with the ores of copper, lead, and silver near Bawdwin in the Northern Shan States, and with copper ores of Sikkim. However no successful attempts to extract the metal on large scale have yet been reported. The richness of the ore is not sufficiently great to allow the working of the metal alone in the present state of the metallurgical industries of India. It is hoped that the metallurgy of zinc will develop later on as a side industry with the smelting of other metals like Copper, Lead or Silver with which it occurs; but till then we have to be content with the imported article.

The increasing demand for copper in India, due largely to the spread of electric power, and the high prices prevailing recently have directed attention to the copper deposits of India. The value of the copper imported into India in 1911-12 was nearly 2 millions sterling which forms more than ten per cent of the average total imports of minerals and nearly twenty-five per cent of the total value of the imported metals. The demand for copper is still further expected to expand as a consequence of the numerous projects in contemplation for the development of electric power.

Copper was formerly smelted in considerable quantities in Nellore district in Southern India, in Rajputana, and at various places along the outer Himalayas in which a persistent belt of Killaslike rock, from Kabul in the Northwest to Sikkim and Bhutan in the East, is known to be copper bearing in numerous places as in Kulu, Gashwal, Nepal, Sikkim, and Bhutan. Copper ores are also widely distributed in the Narnaul district of the Patiala State specially in the Southern half where they were extensively worked in the past. In Chhota Nagpur, several attempts have been made to work lodes reputed to be rich in the metal, but in all such attempts the ore has been smelted for the metal alone and no effort has hitherto been made to utilise the accompanying sulphur as a bye-product. In the Singbhum district a copper bearing belt persists for a distance of several miles and includes several lodes, some of which, at Rajodha, have been proved by borings to persist to a depth of over 1,000 feet. Copper pyrites occur in the Simla Hill States and also at Dariba in Bikaner State. At Baragandha in the Giridh sub-division of Hazaribagh, a low grade ore body about 14 ft. in thickness has been prospected by shafts to a depth of 350 feet, and an unsuccessful attempt was made a few years ago to work the ore. Recent work has proved the existence of valuable lodes in Sikkim, the copper being associated with Bismuth, antimony and Tellurium.*

* Sir T. H. Holland. Sketch of the Mineral Resources of India, p. 29

The copper ores in the Singbhum district of Bengal have been the subject of exploitation on European lines by various companies during the last fifty years, always with disastrous results in some cases due to the poor character of the deposit attached and in others to the unwise expenditure of limited capital on expensive plant before the deposit had been proved. Recent work by means of the borings made by the Geological survey shows that generally speaking the ores of Singbhum are of low grade, and on the whole just below what is likely to be payable except when working with very large quantities of the ore. Prospecting in the Tistavally of Darjeeling district seems to give favourable results.*

The copper ores, at Matigna§ in Dalbhum, occur as rather indefinite lodes inter-bedded with Dharwar phyllites and schists. Sometimes the ore is collected into fairly well-defined bands, but very frequently it occurs in the form of grains disseminated through a considerable thickness of schists so sparsely as to be unworkable. Whereas if the same amount of copper mineral had been concentrated into smaller thickness of schists, workable deposits of ore would have been found. When concentrated as at Matigna the ore may be of fairly high grade and well worth working if proved to exist in sufficient quantity to render it worth while to erect the plant necessary to handle large quantities of the ore. At some places as Rajodha, at Rajodha some rich ores are obtained : but in general the ores seem to be very poor, indeed as seen at the outcrops, where they have not been removed by the ancients.

However, the latest report about the copper deposits of India is more hopeful. "In the course of next few years it is to be hoped that copper will take an important place among

* Records of Geol. Sur. of India, Vol. XXXI, pp. 1-4.

§Rec. G. S. I., Vol. XXVIII, p. 36.

the mining industries of India. At present the industry is still in the prospecting stage both in Sikkim and Singbbum, although an output of 864 tons of ore valued at £ 2,304 has been reported from the latter district. 290 tons of the ore valued at £ 579 were also won in the Myitkyina District* in Upper Burma, and 2 tons valued at £ 4 in Garhwal in United Provinces.”§

It will be seen that future of the copper smelting industry is doubtful, at least so long as the Future of the Industry Foreign Supply. processes for the utilisation of the other elements with which the copper occurs are not adopted. It will take some time before India could manufacture different metals like Bismuth, Antimony, Tin and utilise the sulphur found in copper ores for making sulphuric acid; till then, we have to be content and satisfied with the imported metal. So also brass has to be imported, as it is so costly here in India to melt together the two metals copper and zinc if imported separately; while for the factories that smelt and extract the metals the preparation of alloys like brass or German silver is very cheap as it constitutes a kind of utilisation of the waste heat of the furnaces. This heat is utilised in melting the alloys and rolling them into sheets. Moreover, there is little margin of profit in the making of the alloys by themselves and so it does not pay except in connection with the larger smelting industry. Thus we have to depend upon the foreign supply for both the metal copper and its alloys for a pretty long time to come.

* “159 tons of copper were extracted during 1911.”—Letter dated. 24-6-12—addressed by the Secretary of the Mining Company to the Calcutta papers.

§ Records of Geol. Sur. Ind., Vol XII, p. 170. Report of Min. Prod. during 1909-10.

SECTION VIII.

Suggestions for Improvement in the Industry.

It has been already seen that industry is more successful if worked on a large scale. The nature of the work itself is such that efficiency and cheapness could not be attained in the absence of perfect division of labour which in turn necessitates production on a large scale. It was also pointed out that the nature of the work does not permit of any lowering in cost of production by the introduction of costly machinery. On the other hand, it was noticed that the factories for working brass and copper could not thrive against the competition of the indigenous workers and their manual and personal labour. Any line of improvement or progress on the old system, therefore, should be rather slow and thoughtful.

**The workshop
or
the factory.** If we describe our present methods as coming under what is called the artisan system, our aim should be to raise the industry to the workshop system but not to the factory system; that is to say, without encumbering and embarrassing ourselves with costly machinery we should modify our methods in a cheap manner, by the introduction of such small pieces of machinery which save labour and time but which do not require a high initial cost. For example, the ordinary lathes used by the copper smiths are irregular and discontinuous in their working and can be replaced by a little more costly machines from England or Germany which would run continuously. Again, small hand machinery could be used for cutting or punching sheets of copper and brass into circular and oval discs etc. of required size. Small hand presses could also be used for stamping out pieces of sheet into various forms and with less labour and in less time. Small machines would be useful for making small buttons or boxes etc. of brass; simple pieces of machinery could be used for shaping brass and copper vessels instead of the rough process of hammering used at present. In general, the tendency to introduce cheap hand-

Necessity of Production
on Large Scale.

The workshop
or
the factory.

Introduction of Hand
Machines,

machines in place of manual labour should be introduced as it would lower the cost of production in the long run. At the same time the failure of many of the copper and brass factories* should not be lost sight of, as showing that the industry cannot bear the heavy expenses of costly machinery. In these days when electric power is getting cheap, it will not be, perhaps, unreasonable or out of place, to expect the growth of this and other industries in small workshops using small machinery worked by the electric power.

Possibilities of
small machines by
power.

The necessity of paying great attention to the industry in the art schools was already pointed out. Such schools should be useful in spreading the ideals of Indian art and also should open new lines of manufacture of such articles as are imported now. Though at present many places, brass locks, and brass castings, and various kinds of instruments are being made, the industry is handicapped for want of intelligent and capable workmen. The finer articles of manufacture like musical and scientific instruments require an amount of skill and intelligence which must be imparted to the workman in the Art or the polytechnic schools.

Increased Attention to the
Industry in the Art Schools.

Besides the manufacture of articles of domestic and general use, the number of forms in which copper and brass could be worked is very great; and by care and selection the industry could be so extended as to displace many of imported articles. There is no reason for example, why small articles like door hinges, handles, or rings, padlocks, lamps, gas and water cocks, brass stands, wracks and cages, brass buttons, and some of the scientific (mathematical, surgical, chemical or physical) apparatus should not be

Development of new lines
in brassware,

* With a view to inquire into the causes of the difficulties experienced by the factories, the writer wrote about 25 letters to different metal factories in India: however it was surprising to find that none of them replied, nor was a single letter returned to him on account of wrong address. The writer takes the opportunity of thanking the ordinary whole sale workers, in the industry, for much of the information collected.

manufactured in India, and should be imported while the skill and scope of working for the same could be developed here. It is true that many of the brass foundries and the workshops for advanced work do try to produce some of these things, but generally they lack in finish and polish, and sometimes cost a little more when compared with foreign manufacture. It is to be hoped that with more systematic work on scientific lines, and with the help of better workmen turned out from the proposed art and technical schools, this branch of the industry will receive its proper share of attention and development. ✓

It should be pointed out that, to a certain extent at least, better training of our artisans is very necessary at the present stage. For, it can be easily seen that after a certain time when the copper and brass ware has been displaced by Aluminium (as it is already to some extent in Southern India) and tinned, galvanised or enamelled iron ware, the industry of making brass vessels for domestic use is likely to go down. In such a case, if no preparation is made in the form of the variety of openings for the industry suggested above, the copper and brass smiths of India may have to come to grief.

One of the reasons why the larger copper and brass factories have not thrived is the large expense they have to undergo in sending their salesman to advertise and sell their goods; very often these agents are not efficient or careful. The articles made by these factories are of a little new type and being generally thinner are looked upon with distrust by the people. In the case of the small capitalist who employs a number of workmen to manufacture the vessels, this item of expense is small or rather becomes a part of his own profit. Going a stage further, it is not impossible for the workmen themselves to combine and co-operate in the manufacture as well as the sale of their goods without letting the middleman to interrupt and diminish their

Necessity of better training for the artisans.

The cost of marketing,

Co-operation among the workman for buying and selling their goods.

profits. By systematic co-operation along the lines of Co-operative Credit Societies it will be profitable and possible for them in getting the sheet-metal cheaply and also in disposing off their goods at much better rates than what they do at present. Perhaps as is seen in other countries the sheer force of circumstances will soon point out to the artisans, the feasibility and necessity of combination on a larger scale.

<p>The help needed from the State is of various kinds. This is not the place to discuss how far State help is justifiable ; it has been recognised in India and extended many industries like Tea, Jute, Sugar etc. The starting of the departments of metal working in copper and brass in the Arts schools, as suggested above, though not requiring much money, is impossible without State help. It will not be wise to expect the public to shift for themselves and take the initiative looking to the interests involved. The industry could be helped in other ways also. Thus it has been recommended* that rail-</p>	<p>way freights should be reduced for the metal used in the industry <i>e. g.</i> the sheets and ingots of the metals imported from large distances.</p>
<p>State Help.</p>	
<p>Art Schools.</p>	
<p>Reduction in the Railway Freight.</p>	

In conclusion, it is fervently hoped that this brief and necessarily inadequate account of an industry, which has retained and which will retain for a long time to come, the purely indigenous characters of the Indian industrial life, will inspire development along national and scientific lines. At present, the industry may be said to be drifting along uncertain paths according to the fancy of the petty craftsman, whose vision is so narrow and horizon so limited. It needs sincere and sustained efforts on the part of educated Indians to raise this craftsman to the position of an intelligent artisan, able and anxious to improve the quality of his work. We need more mechanical knowledge to come to the help of these artisans who have so far been

* A. C. Chatterji—Note on the industries of the United Provinces of Agra and Oudh.

able to withstand foreign competition ; and we need better type of men as capitalists or managers at the head of these artisans. There are splendid chances in the case of this industry to try the workshop or the artisan system instead of the factory system which has been attended in the west with many social evils. Let us then devote greater attention and harder work, so that this great and ancient industry which maintains its individuality throughout the length and breadth of this vast continent may gather strength and energy necessary in these days of strenuous competition.

Co-operative Village Libraries

BY

Professor Jogindra Nath Samaddar,

B. A., F. R. E. S., F. R. Hist. S., M. B. S. A.

—————:O:—————

Even the most pessimistic man will have to admit now that the Indian Co-operative movement has achieved a distinct success in rescuing many of the poor raiyats of the country from the shackles of *Mahajandom* and there can be also no denying the fact that it is indirectly increasing the wealth of the Country. But it has all along been claimed that the end of Co-operation is not simply "the shaking off the burdens", or the mere production of wealth. It has been urged over and over that it has greater aims,—or in other words, there are the intellectual and social sides of this movement, which will bring comfort to those sufferers for whom the movement is meant primarily and strengthen the moral character and broaden the mental horizon of the people.

It was to place before the public one of the side lights of the movement, that I addressed the following letter to the Editors of the Calcutta Dailies, and it was promptly published by them in their issues of the 28th January, 1909, that is to say four years before this day. I make no apology in quoting it in extenso, as what I have got to say to-day is based on that letter of mine and what could be said then, applies with greater force now. This was the letter:—

" To the Editor,

Sir,—The other day, Sir D. M. Hamilton spoke on "Zeminderies on Co-operative lines" by which he proposed that Co-operative credit should be employed to make youngmen Zeminders "with an income of Rs. 200 to Rs. 250 per month besides the honorable position of Zeminder—not a fortune certainly, but sufficient to enable the young men to live a comfortable and honorable life,—not servants but masters—free and independent".

I humbly beg to suggest that Co-operative credit can also be employed on a like plan to create a large number of "Co-operative Village Libraries" which would be able to do an incalculable amount of good.

The credit movement has planted its hold definitely in India and is in fact working wonders. Although the main and direct object of the Co-operative credit movement is to improve the deplorable status of our poor raiyats, still the services of this movement can be indirectly employed to bring about a moral and literal regeneration amongst us. I propose that Co-operative Village Libraries should be started either (1) along with the societies which have been started or (2) individually by the Co-operation of neighbouring villagers with limited liability and with Co-operative credit as its principle. In the former *i. e.* in (1) the nucleus of a small but useful library can be utilised for the benefit of the raiyats,—a good weekly can be subscribed for and the secretary of the society or the Punch may be directed in reading these books and newspapers to the members. I see that there are now at present in Bengal alone some 375 Co-operative credit societies with some 12,000 raiyats as their members. The institution of small village libraries would do an immense amount of good to these raiyats.

Regarding (2) I hardly need to dilate on the necessity of a library which stocked "with readable books" should properly direct the people—what 'to read' and what 'not to read'. Instead of reading anything and everything, books relating to agriculture and industries should be stocked and read—the standard to be decided according to the capacity of the members constituting those libraries. Incidentally the services of the members may be utilised by asking them to collect facts and figures relating to the villages—agricultural, industrial—statistics and all sorts of information relating either to the past or to the present.

I need hardly add that these libraries in both the cases may serve as well for centres of innocent amusement. I commend this humble suggestion of mine to all—young and old—including the worthy Registrars of Co-operative Credit Societies and if the

Registrars would kindly try to carry into practice my idea, I may say that a friend of mine is willing to bear a portion of the initial cost of one or two Libraries in the experimental stage.

I do not know whether my humble suggestion attracted the attention of all the Registrars of Co-operative credit societies of that year but two of the Registrars very kindly wrote to me two letters from which I make the following extracts. Mr. Gomlay who is now the popular private secretary of a popular Governor wrote to me thus: "Few of the members can read and so Libraries could not be very useful yet. *Later on, perhaps.*" The other one was from Mr. M. Kuwar Singh who was then the Registrar of Co-operative Societies of the United Provinces. Mr. Singh wrote: "I have read with interest your letter in "the Statesman" of the 28th January on Co-operative Village Libraries. Your idea is both interesting and original and doubtless in a province which is educationally advanced, there is a field for such libraries. My only fear is that in the United Provinces where primary education is so backward, there would be more difficulty so far as villages are concerned. Co-operative urban libraries, if started and supervised by some public-spirited gentlemen, would however serve a most useful purpose."

We find that the two Registrars who very kindly considered my suggestion were of opinion that but for the illiteracy prevalent amongst the raiyats, the scheme would be a very useful one. My object primarily was however to make the members of Societies more literate and in those cases where the members were altogether illiterate, my suggestion was that "the secretary or the Punch may be directed in reading these books and newspapers to the members". I venture to believe that this suggestion could be easily carried out, for the Secretary and the Punch are bound to be literate men under the provisions of the law.

Thus far regarding the cases of those Co-operative Societies, the members of which are illiterate. Let us then take up the cases of literate members, and specially of the urban members. The Rev. I. O'Donovan, an Irish clergyman and a strong advocate of the Co-operative system writing on "Village Libraries" in "the Irish Homestead" the organ of the Irish Agricultural Society thus wrote:—

"Young people educated in our primary schools, and often in our intermediate schools, are intellectually only little children. Their taste requires to be directed. Hitherto, unfortunately, this has been neglected, with the result that intellectually the country is on the verge of being in a hopeless state. It is no exaggeration to say that the literary taste of the people is false. For the most part they read nothing but wretched trash. Beyond the daily and weekly newspapers the only reading matter of the majority of the reading public in Ireland is low London productions, which are neither good literature, nor good morals, papers that often pander to the lowest impulses of man's depraved nature. The least harmful are bad novelettes, perhaps not morally bad, but productive of evil nevertheless, as they are read by imperfectly educated young men and women with no knowledge of life, who are led to believe that what they read of in these books exists, while it is all unreal, false, impossible."

I believe, there is much truth in what the writer states above and what is applicable to Ireland regarding the above picture, applies with still greater force to India. So far as my experiences prove, an effort must be made by the Government, as well as by the leaders of the people, to stop this sufficiently serious state of things. "There is much talk of national rehabilitation," as one happily puts it, "but let those whose hearts are devoted to the cause have a care lest when it comes, Cockneys are not found seated in every Cabin throughout the land."

The system of Co-operative village libraries was advocated in Ireland some ten years ago. The proposal was that there should be a library in every parish and the work to be done by the parish library should be of a comprehensive character. The advocate of these libraries suggested that the following line should be adopted by them.

1. Books on technical subjects to be kept, from which the people may learn something of the two great problems that concern us and the welfare of the nation most,—agricultural and industrial development.

2. As the libraries will have to change an 'unliterary people'

into a ' literary people ', instead of vapid books, good literature should be placed in their hands.

3. An attempt should be made to revive and give a new impetus to the Irish language.

Now, certainly the circumstances relating to Ireland " where every one is able to read " are not applicable to India, but I venture to think that to do away with the gloom of ignorance which pervades throughout this land of yore, it is all the more advisable that systematic attempts be made to start village libraries all over the country. I am strongly in favour of carrying on the first experiments on the Co-operative Credit Societies—be they rural or urban—as the members of these societies have already some sort of training and it will be easier for them to grasp the objects of these libraries and to profit by them.

I don't think we will require much money to start with say, for 2 or 3 Societies and even if it is required, I am sure money will not be wanting in. Although a poor man, I am prepared to spend a few hundred rupees to enable us to see how far this idea can be carried on and I shall be only too glad to hear from the Registrars of Co-operative Credit Societies on this subject and Co-operate with them.

The credit movement has come to stay with us, in spite of many ominous forebodings. It has been working on smoothly, to the great delight of our Government which is mainly responsible for its growth and development and for which we, the people of India, are deeply grateful to it. And over and above all, there is in the movement itself " something "—call it sacred, call it heavenly—or by any name by which you want to designate it,—something, which makes us acclaim with our talented poetess

" Nay, do not pine.....though life be full of trouble,
Time will not pause or tarry on his way.
To-day that seems so long, so strange, so bitter,
Will soon be some forgotten yesterday."

Causes of the General Failure of Oil Pressing Industry

IN

the Bombay Presidency

BY

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(Tech : Manc.)

Santacruz, Bombay.

Last year while investigating on the prospects of oil pressing industries of India and the best means of developing them, I was asked by some merchants and friends to prepare a report bearing on this industry. On their initiative I undertook the work of drawing up a report showing the position of the industry and its possible developments. For this purpose I visited several Oil Factories in places outside Bombay like Baroda, Surat, Poona, and Bulsar to obtain information at first hand. I had also several interviews with oil Seeds and oil Merchants and my best thanks are due to the Indian Merchants Chamber of Commerce and Bureau of Bombay for arranging these interviews and also to Mr. Mathuradas Goculdas, late Manager of the Peeroo Mahomed Oil Mills Ltd. and the proprietor of the Thakar Soap Factory and Vital Mantle Factory and such other friends who have rendered to me valuable assistance.

Till recently the reputation of the oil pressing industry was at its worst, and failures were recorded everywhere. Companies after Companies were organised and several Oil Mills were started from time to time in Western India but with the solitary exception of the Peeroo Mahomed Oil Mills Ltd. which worked successfully for 25 years, all proved failures. To-day the capitalists and business men are not favourably disposed

towards this industry and are in many quarters extremely hostile to the idea of establishing Oil Mills in the Bombay Presidency.

In 1902 Mr. F. G. Sly, the Director of Agriculture, published a pamphlet (Bulletin No. 9 Dept. of Agriculture) on the Cotton Seed Oil Industry; since then the problem of oil industry has occupied a prominent position. Two more publications of importance have since been made by the Government of India. In 1907 the question was discussed at the Indian Industrial Conference and from 1908 several attempts have been made to organise this industry on a better scale. Two or three new companies were registered. At this time several articles were published in the Indian Trade Journal (Vol. VII) on cotton seed oil industry. These articles created further interest in the public and led to the formation of some more Companies. Unfortunately all of them proved abortive. Thanks to the efforts of Prof. T. K. Gajjar, the pioneer of Chemical industries in Western India, and Mr. Ralph C. Whitneck, late Economic adviser to the Gaikwad of Baroda, Mr. Fredric Noel Paton, Director-General of Commercial Intelligence, and Dr. Harold H. Mann public faith in the future of this industry was maintained in spite of the above failures. Prof. T. K. Gajjar in 1909 himself projected the Navnit Oil Manufacturing Company Ltd. with a capital of Rs. 5,00,000. Part of the capital about Rs. 150,000 was subscribed by the organisers and their friends, but the public had lost all hopes in the commercial possibility of the oil industry in India, and no more shares were applied for, although every attempt was made to start the work of this Company. Finally the whole concern had to be wound up. Prof. Gajjar had also organised The Alembic Chemical Works Ltd. which received a satisfactory response from the public whilst his Navnit Oil Manufacturing Company project had to be abandoned. My efforts were, at the outset of my investigations, directed towards finding out the causes of failure of this industry in Western India. As far as I could judge, out of the various causes that determined the fate of the in-

industry in its primary and experimental stage, the following may be given as the principal causes of failure.

I. At its very beginning, unfortunately, this industry received the attention of the adventurous class of men who had no special knowledge or experience of it. Without proper expert guidance or experience they framed schemes with the help of the Machinery agents, who knew next to nothing about the chemical and economic side of oil pressing industry and the consequences of whose ignorance had to be borne by the Oil Companies, and its pioneers.

II. Acting under the advice purely of machinery agents the early Companies started with an uneven distribution of capital, paying perhaps too much for the machinery and leaving too little for Buildings, working Capital, employment of chemical experts &c. In two instances in Gujerat we find that the concerns were started with a nominal capital of Rs. 1,00,000 each, of which only Rs. 60,000 were called. From this sum the machinery is reported to have cost as much as Rs. 50,000 for a plant to crush 16 tons daily, leaving only a balance of about Rs. 10,000 for land, buildings, working capital, stores &c. Starting under such circumstances, however promising an industry may be, it is bound to fail.

III. As the natural consequence of the above, in seven cases of ten, the Mills had to be mortgaged from the very beginning, and if the originators and promoters did not possess sufficient influence they had no facilities even to borrow money to meet working expenses. Special stress must be laid on this point.

IV. Mr. P. R. Chaudhri of Calcutta in his paper on 'Oils and Oil Seeds,' read before the Third Indian Industrial Conference drew our attention to other features; he remarks, "It was also then that I came to know of the deplorable *shortsighted policy* of these Millowners, the faulty economic basis on which some

of the Mills were managed and to some extent, the regrettable want of honesty." Dr. Lewkowitsch in his speech before the Indian Guild of science and Technology similarly remarks: "As another example, I might point to the industry of *Edible Cotton seed oil*. India, as you know, produces an enormous amount of cotton seed. The bulk of these is shipped to Europe to be worked up there into oil and cake. This industry should be retained in India and an important industry might be created, if it were taken up in India in the proper manner. In Bombay actually some Mills have been started; but look at the way in which this has been taken up by these apparently enterprising people in Bombay. They first thought of the edible cotton seed oil industry in the United States of America, and because the Americans were successful they thought that all they required to do was to send out a commission to look at the American Mills and to place an order for a large plant in America. Then the thing should work by itself. Unfortunately they overlooked the fact that the individuality of the Indian cotton seed ought to be studied; naturally failure was bound to come, as indeed it did come."

V. Some of the Oil Mills are equipped at random with Machinery suited to crush other varieties of seeds than their own particular requirement. I lastly visited a concern which though established for crushing cotton seed did not possess a single piece of machinery that is required for the special treatment of this seed while they had a regular plant for treatment of castor and other seeds. I have seen this instance even pointed out in a confidential Government report, on the subject. In some other cases I was surprised to find that Mills were equipped with old or rejected machinery brought from England or elsewhere. In the case of a Bombay Mill, which of course ultimately failed, I was told that the management had scarcely a day passed without some mishap or the other happening to the machinery.

VI. There has been considerable ignorance as to the proper treatment of oil seeds and oils, and no small amount of difficulty was experienced in treating and refining the oils. At one of the Mills I visited, when they were crushing castor seeds, and did not, for some reason or another, get the proper colour and the peculiar florescence of the Crude oil, they tried to remedy this defect by putting in the Edge-runner a quantity of some harmless colouring material (turmeric) with the result that the merchants refused to buy both the oil and cakes worth about Rupees 20,000.

VII. During the monsoon and to some extent in other seasons, it is very difficult to store cakes, as they soon go mouldy and get heated up. Thus they get considerably deteriorated in value, where proper measures are not adopted for their preservation.

VIII. There is a very small local demand for cakes, and most of the cake is exported. This export business can only be paying if it is placed in the hands of reliable men, as we have to deal with a distant and unknown market.

IX. Rail and shipping charge of oil and cakes being very high some of the Mills located at long distances from the market or shipping port found it financially impossible to bring both the oil and the oil cakes to Bombay which is their chief market. In Broach, Baroda and other towns the faith of the people in the cakes and oil pressed in the native Ghanis make it difficult for the machine pressed cake and oil to find buyers locally.

X. Again in places like Broach, Baroda &c. seeds were not available in large quantities all the year round and they had to buy them from the Bombay Market. Thus they had to pay Rail charges both on the raw materials and on the oils and cakes, for ultimately the whole output had to be consigned to Bombay.

XI. As regards the exports of oils, there is considerable difference of opinion, but the majority of them are convinced as to the non-paying character of the export trade. Dr. Harold H. Mann and others inform me that the export trade in oils at present is not paying and any attempts to do so have met with failures. Five reasons for which are given.

I. High freight on oils.

II. High price of casks.

III. Loss by leakage.

IV. Loss by absorption.

V. Gross adulteration of exported oils by earlier shippers. I am convinced that unless we can ship our oils in bulk as mineral oils there are very few chances of success in that direction.

As regards the loss by leakage and absorption I am informed by Messrs. Ransom and Company of London that if the casks are silicated or glued from inside these losses can be minimised. The English and continental buyers do not like to buy Indian oils on account of the gross adulterations that were practised by early shippers. It being easier to detect bad quality of seeds than an adulterated oil they prefer to buy seeds and not oils.

XII. The Indian farmer and cattle owners refuse to buy machine-made cakes for fodder as the percentage of oil in the country oil cakes is greater than in the Mill cakes. Though the percentage of oil in Mill cakes is less, it is erroneous to suppose that these cakes are poorer in quality as feeding stuffs. All the same it is very difficult to fight against this prejudice of the farmers and we have to face the situation as it is.

XIII. As the export trade in oil was, in the opinion of many, a non-paying business and as there was a very small demand for cakes it was found that the extension of the oil pressing industry was limited to the local demand for oils for

edible purposes and as lubricant. The Indian Bullock oil presses supplied the Edible oils and there was very little demand for the oils obtained by machinery. In fact the supply increased more than the demand and as there are no industries depending upon the utilization of oils, *e. g.*, soaps, candles, margarine &c. the newly started oil Mills worked spasmodically and consequently were commercial failures.

XIV. Another serious cause of failure was found in the growing demand of mineral oils for burning purposes. Till the beginning of this century large quantities of vegetable oils were used for this purpose, but as these oils were dearer than the mineral oils their consumption was seriously checked.

XV. On the one hand without proper knowledge and special experience the oil crushing industry was presenting inexplicable difficulties to the native Indian merchant, and on the other hand, shipping and financing facilities for the exportation of the raw material namely oil seeds themselves acted as a powerful inducement to our merchants and this brought about a further neglect of the otherwise important oil crushing industry. Special emphasis must here be laid on the detrimental effect produced by prolonged storage of seeds and cakes in this country. It was always found safe to send them out of India, as early as possible. Seeds stored in the warehouses of the Mills had considerably deteriorated and were found in many cases unfit for pressing purposes. Before concluding this short paper I must here mention the particular case of the cotton seed oil industry. In its very beginning it had lamentably failed as failure was bound to come. There was no technical guidance, no lucrative market for machine pressed oils and the products like hulls, cakes &c. Demand had to be created and in doing so reverses had to be encountered. Then character of the seeds had to be studied and the refining processes had to be perfected. This was only possible if the experiments had been financially supported. Messrs. Tata Sons and Company are to be specially congratulated on taking up this industry in the right and proper spirit and it is hoped that their experience

will work as a valuable asset for the future of this industry in India. The Indian Cotton Oil Mill Company Ltd. of Navsari is also to be congratulated on having successfully terminated their experimental stage and on their desire and effort to place their Company on a sounder basis by increasing their original capital. Having taken into consideration the prominent causes of failures I am optimistic as regards the future of this industry and given technological skill, bonafide workers, facilities for commercial undertaking and organisation on right lines, there is no reason why this industry should fail, if the Government and the people continue in their efforts, as directed at present to develop, and promote this industry. I am sure we shall soon put a serious check on one of the greatest drains of raw materials from India and establish a staple industry which by right would belong to us in the future. New works for the manufacture of soap, stearine, glycerine and candle are started, and lubricants, boiled oils and other oils of technical importance are now made in large quantities in India, and there are now sufficient indications to show that we have passed through the experimental stage, and all the local conditions appear favourable for the founding of this industry on a large scale, and if we direct our future efforts wisely by our experiences of the past we shall have little cause to fear further failure.

The Importance of Manual Instruction

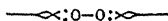
IN

Indian Schools.

BY

H. G. Bhabha Esq., M. A.

Retired Inspector General of Education in Mysore.



The hand of man contains the largest group of small muscles in the human body whose fine adjustments produce what is called skilled labour. Every muscle in the body contracts under stimulus of nerve force proceeding from the motor centres of the brain, and this outward or efferent current is either the result of a sensory or afferent current from the surface of the body to the sensory centres of the brain, or at other times of the will to move a particular limb or muscle in a definite way to accomplish a desired action or movement. The sensory and motor centres are knit closely together in the brain by nerve paths or connecting nerves. At the same time for all voluntary actions there is close connection between the centres of feeling and thought and motor centres which produce voluntary action. The motor centres connected with the hand form a large motor area in the brain, the largest connected with any group of muscles. The movements of the five fingers and the numerous small muscles and joints connected with them when they are used for skilled work all require fine co-ordinations and adjustments, which are produced by the minute regulation of nerve currents from the motor area.

The muscles of the body are divided into fundamental and accessory, the former being those of the trunk and large joints, neck, back, hips, shoulders, knees and elbows, which man has in common with the higher and larger animals. These large muscles are constantly used by hard-working but unskilled labourers who are men of little culture or intelligence. The accessory muscles

are those of the hand, tongue, face and articulatory organs. These are comparatively very small, but they can be grouped into an infinite variety of combinations producing finely adjusted actions like those of writing, talking and piano-playing. The motor area connected with them is very large and complex in the cortical layers of the brain, while that of the fundamental muscles is smaller and simpler in its physical organisation. The smaller muscles for the finer movements come into activity later in life, than the larger and coarser muscles and are most intimately connected with mental growth and vigour. "These smaller muscles might almost be called organs of thought. Their tension is modified with the faintest change of soul, such as is seen in accent, inflection, facial impressions, hand-writing and many forms of so-called mind-reading." The larger muscles are exercised earlier by all kinds of hard and rough labour, by gymnastics and sports. "The day-labourer of low intelligence with a practical vocabulary of not over five hundred words, who can hardly move each of his fingers without moving others or all of them, who cannot move his brows or corrugate his forehead at will, and whose inflection is very monotonous, illustrates a condition of arrest or a trophy of this later, finer, accessory system of muscles."

Stanley Hall in his 'Adolescence' says that "muscles are by weight about forty-three per cent of the average adult male human body. They expend a large fraction of all the Kinetic energy of the adult body, which a recent estimate places as high as one-fifth. The cortical centres for the voluntary muscles extend over most of the lateral psychic zones of the brain, so that their culture is brain building. In a sense they are organs of digestion, for which function they play a very important role. Muscles are in a most intimate and peculiar sense the organs of the will. If they are undeveloped or grow relaxed and flabby, the dreadful chasm between good intentions and their execution is liable to appear and widen. Character might be in a sense defined as a plexus of motor habits." Some men see clearly the consequences of action or want of action, and have a clear judgment and the best of intentions, and yet fail to take the right action at the right moment from want of will power or quick decision. The severance of action from intention is perhaps the most humiliating

feature in the character of some men. The exercise and development of muscles are thus necessary for the development of character and will power.

Such exercise and development are absolutely necessary for the growth of the brain during the period of adolescence. The brain and the muscles react on each other. While muscles grow in size and strength by exercise, the motor centres of the brain connected with them as well as the higher intellectual centres of thought and will grow larger and stronger. The brain cannot be developed fully unless the muscles employed in voluntary actions are systematically exercised.

This development of the brain and character is not dependent so much on the size and weight of the brain or the size of muscles as upon the functional activity of the brain cells called forth by the exercise of the muscles and the complexity of their co-ordinations in activities for a purpose. The exercise of motor cells must to be effective take place during the period of growth. Hence it is from the age of about four to the age of about fourteen, to sixteen that the brain centres connected with the small muscles and joints of the hand and fingers are developed. Thus it becomes necessary to impart manual instruction not only in Elementary Schools but also in High Schools. The muscular activities of the hand can attain a degree of efficiency in this period which is not possible at a later age. Dr. Nicholas Murray Butler defines manual training as "Mental training through the hand and eye," and this definition is the guiding principle of all manual training in the best American Schools.

"The philosophy, if such it may be called," says Stanley Hall, "that underlies the movement (in favour of manual instructions) is simple forcible and sound, and not unlike Pestalozzi's, 'no knowledge without skill,' in that it lessens the interval between thinking and doing; helps to give control, dexterity and skill; an industrial trend to taste; interests many not successful in ordinary school; tends to the better appreciation of good honest work; imparts new zest for some studies; adds somewhat to the average length of the school period, gives a sense of capacity and effectiveness, and is a useful preparation for a number of vocations.

"These claims are all well founded, and this work is a valuable addition to the pedagogic agencies of any country or state. As man excels the higher anthropoids almost as much in hand power as in mind, and since the manual areas of the brain are wide near the psychic zones, and the cortical centres are thus directly developed, the hand is a potent instrument in opening the intellect as well as in training sense and will."

The smaller muscles of the hand can be brought into full vigorous and finely adjusted action only by manual training at the right age during the period of growth. From the age of four to about the age of eight the best training for the hands is given by drawing, clay modelling, and Froebelian occupations, such as brush work, stick laying, bead work, brick building, paper cutting, paper folding, elementary school gardening, etc. These occupations should be followed by cardboard work, ornamental leather work and other similar occupations and gardening to the age of 11, when with the increased muscular growth and vigour of the child wood sloyd may be commenced. Wood sloyd should be followed at the age of 14 or 15 by metal work such as filing, drilling, chipping, soldering, forgework and lathework. Machine fitting and building forms the last stage of mental work in American schools. Students of a Manual Training High School of America who have completed their course leave behind as a rule a complete machine built by themselves as a proof and memento of their skill.

While the above subjects of Manual training are fitted for town schools, other occupations for the Indian village schools may be suggested for children under eleven years of age, such as pottery, basket making, rope making, mat making, and the making of boxes, trays and cups of grasses, rushes, fibres and leaves. Cheap and useful articles may be made of cocoanut fibre and shells. Cloths and rugs may be woven on looms roughly prepared from cheap materials by the children. Wool may be spun and rough country blankets may be woven. Gardening would provide easy, useful and instructive manual work. Sewing, knitting and cooking can be taught in girls' schools at no great cost if the materials are supplied by the parents. Models of various kinds of shelter such as huts, dwelling houses, cowsheds, etc., of the primitive type may be made by children with the use of the

simplest tools like the pocket knife and a small hammer and saw. For older children practical agriculture and sericulture are the most useful industries, every village school being provided not only with a school garden but a small farm, on a part of which mulberry or castor oil plants may be grown for the feeding of the ordinary or eri silkworm.

For schools in towns where commerce and industry flourish, the great want for boys in the lower secondary and high stages at present is of schools like the Manual Training High Schools of America which combine literary, mathematical and scientific education with practical education in drawing, wood work, metal work and mechanical engineering. It has been found by experience in America that far from such a combination of subjects retarding the progress of students intending to proceed to colleges, it helps progress in the old literary course and turns out and more up-to-date all round men, physically, mentally, morally superior to the young men educated in the old classical schools. In these schools while the literary and scientific course occupies from 10 to 15 hours a week, the practical teaching or mechanic arts as they are called in some schools occupy from 12 to over 20 hours a week. Similar schools are maintained by the Paris Municipality in which general education of the secondary type is imparted in the mornings from 9 to 12-30, and high practical education in drawing and design, mechanical engineering, or all the departments of printing is imparted from 1 or 1-30 to 6 for five days in the week.

For rural districts in India in which agriculture and farming flourish the best kind of secondary schools are institutions like the Hampton and Tuskegee Institutes, in which ample provision is made both for general education and industrial education in all such branches including agriculture and farming as are most useful to the public, to enable every negro youth to acquire the means of honourably earning a decent livelihood. These institutes have revolutionised the social and economic condition of all negroes in South America, who now form a contented prosperous and successful community, and can compete successfully with the white races even in the learned professions of doctor, engineer, lawyer, and clergyman. Such institutes will no doubt cost heavy sums of

money to equip, but a beginning should be made by Government until India becomes a rich country and its wealthy people learn to part with their wealth for the education and prosperity of their less fortunate countrymen.

India is at present at the commencement of a great industrial awakening. Its progress and future prosperity will depend upon the educational policy now adopted by wise administrators. The success of Hampton and Tuskegee as educational institutions which have raised the character of the coloured race and rendered thousands of the race self-respecting, prosperous and useful citizens is full of practical lessons for educationists in India. Education for the common people in India before the advent of the English was confined to reading, writing and arithmetic, the higher classes receiving purely Sanskrit education of the type given in pathasalas. After the formation of the Education Department in India under British rule to the present day, education has been almost purely literary from the primary school upwards to the college. Sufficient attention has not been paid to technical and scientific education, manual and industrial instruction in schools of general education has not even been commenced, and the methods of instruction adopted have been such that habits of observation, reasoning and research have not been cultivated. The same mistake has been made in India from the oldest times in making public education almost wholly literary as was made by the New England missionaries when they first went to South to educate the negro. To add to the disastrous effects of a false ideal of education, the prejudice of the Virginian planters against the education not only of the coloured children but also of the poor whites, based on the old feudal system of society, which assigned duties but gave few privileges to the different classes in the social scale, has been repeated in India. The cry has often been heard in India, though it is less frequently heard now than it was heard some years ago, that the people should pay for their own education, and that it is not the duty of the State to educate the people. What the Government spends comes from the pockets of the people, and if the people are unable to pay more, or to tax themselves specially to provide for their education, or to appreciate a more beneficial system of education than the present even if they have the means

to pay for it, then no efforts need be made to retrench expenditure in other directions to provide for an increase in the cost of the people's education. In America, on the other hand, it is the deepest and most cherished conviction of the people and the State that the trained intelligence of the people is the highest asset of the State, that all moneys private and public spent on education are the best investment, that natural ability, wherever it may be found, irrespective of race or social class, should be cultivated and developed to the highest possible extent. The vast natural resources of the country and the wealth of the people enable the Americans to spend fabulous sums on educational institutions. But the development of the natural resources of the country and the wide dissemination of a highly useful and productive education have reacted as they must on each other as cause and effect in America. The conditions of India, however, are widely different from those of a rich progressive country like America. India is essentially a poor country dependent chiefly upon agriculture, 66 per cent of the population being agriculturists. In such a country advance in the spread of education of all kinds must be necessarily slow. And when the funds are insufficient for encouragement of all grades of education, necessarily higher education has to be made self-supporting as far as possible, the savings being devoted to primary education. Much nevertheless can be done in India by adopting a better ideal of education for the people, by combining manual and industrial instruction with the general education of the masses, or in other words by giving a practical combined with literary education, to enable the people to attain to greater competence and a higher standard of living, and also by adopting more correct methods of education from the infant class upwards in all schools.

The education of the masses has to be made as practical and productive as possible, while at the same time it should be such as will improve, strengthen and elevate their character. For such education there is no better model than that adopted in the Hampton and Tuskegee Institutes. Agriculture should be practically taught by trained teachers from the village schools upwards in all primary and secondary schools according to a graduated scale of instruction. School gardens should be established in connection

with all schools and nature-study encouraged. Manual training should be commenced from the lowest classes, and industrial education combined with the usual school subjects in all primary and secondary schools. What industries should be taught must depend upon the local conditions and what the people want to have done for themselves. It is quite practicable, nay it is imperative, to combine five periods of theoretical instruction say of 45 minutes each with practical work for about three hours every day. Such a combination would make the children more alert, more fond of studies as well as hand labour, more healthy and more likely to achieve success in life, than if their education was confined to only one kind of instruction. The establishment of Normal and Agricultural Institutes like that of Hampton and Tuskegee, at first one for each province or group of districts, and later one for each district, would be the salvation of the people of India. In productive efficiency, in wealth, in self-respect, and character, in the hatred of shallow politics such as the idle, ignorant and thoughtless indulge in, the people would make rapid advance and thereby increase their own happiness. A contented and useful middle class would then be created such as now hardly exists in India.

The Place of the Domestic Industry in Indian Economic Life.

BY

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Section I.

The economic transformation of the village : The gradual extinction of the Cottage industry.

India is now in the throes of a great economic revolution.

India is in a state of economic revolution as shown by a contrast between city India and rural India ;

A contrast between city life and village life would show the fundamental character of this revolution. Rural India is old ; city

India is new. Rural India carries on the production, distribution and consumption of wealth in a manner which is strikingly different from that of city India. The structure of rural society has hitherto rested and is still resting to a certain extent on status, while the cities are rapidly coming under the sway of competition. Indeed the economic ideas of the city are not only far removed but in some cases are actually antagonistic to those of the village. The village is still almost self-sufficing, and it itself an economic unit. The village agriculturist grows all the food necessary for the inhabitants of the village. The smith makes the plough-shares for the cultivator and the few iron utensils required for the household. He supplies these to the people but does not get money in return. He is recompensed by mutual services from his fellow villagers. The potter supplies him with pots, the weaver with cloth and the oilman with oil. From the cultivator he receives the traditional share of grain. Thus almost all the economic transaction are carried on without the use of money. To the villagers money is only a store of value, not a medium of exchange. When they happen to be rich in money, they hoard it either in coins or make ornaments made of gold and silver. The village agriculturist possesses little capital. He lives from hand to mouth. The Banya supplies the cultivator with seeds and charges an enormous interest

But the cultivator pays the interest ungrudgingly ; though he stoops under the heavy burden he does not improve his position. There is no desire for a better, more comfortable living, both among the cultivators as well as among the artisans. The artisans follow their hereditary occupations. There is no competition, no stimulus for improvement, no change in customary wages. The industries are stereotyped, the apprentice only tries to imitate his master and rarely thinks of introducing new implements or new methods of manufacture. Thus "the village communities are the most complete and the most contented in the world. Within their self-sufficing confines trade is no vulgar source of profit for which men scheme and strive, but a calling, often a holy calling, handed down from father to son through generations, each with its own unchanging ideals, its zealously-guarded craft.

But the village life is being transformed. The city sends to the village Manchester cloths and these are

And by the gradual transformation of Rural India,

replacing the cloths woven by its weavers. Not only weavers but also other artisans are losing their occupations and turning to agriculture. The cheap kerosine oil from Baku or New York threatens the oilman's existence. Brass and copper which have been used for vessels from time immemorial are threatened by cheap enamelled iron-ware imported from Europe. The village sugar-cane is also in danger on account of the competition of imported sugar which is sold at very low price. The manufacture of sugar from *gur* tends to become unremunerative. The demand for *gur* also falls off when the price of sugar is brought down by competition. There is also *pari passu* a transformation of the taste of the consumers. They abandon *gur* for crystal sugar. Home-woven cloths are now replaced by manufactured cloths for being too coarse. All local industries are attacked and many have been destroyed. Villages that for centuries followed customary practices are brought into contact with the world's market all on a sudden. For steamship and railways which have established the connection have been built in so short an interval as hardly to allow breathing time to the village which slumbered so long in the regime of custom. Thus the sudden introduction of competition into an economic unit which had from time immemorial followed custom has wrought a mighty change.

New economic ideas have now begun to influence the minds of the villagers. In some of the villagers

The changes in rural economy:

(a) The annihilation action of the village crafts.

(b) The rural exodus.

the weavers and the blacksmiths have no doubt been compelled to leave their occupations on account of foreign competition but more men are leaving their hereditary occupations of their own accord. All Brahmins are not priests now. Many indeed live according to the old ideas, and view the temptations and vices of the west in "silent deep disdain". But a few of them who have felt the impulse of a new life have gone to the cities. Those who are intelligent become lawyers or government servants, and those who fail in the competition become petty clerks in Railway or mercantile offices. The middle classes also leave their village and get scattered all over the country to earn a living. A writer thus laments the decline of villages in Bengal. "In days long gone by our villages vied with each other as to which had the best Sanskrit Pandits and the best Tols, which had the largest number of Durga-pujas and where the largest number of people of all castes were fed. The days are gone by when each village was proud of the products of its looms, of the hoes made by its blacksmiths, its Jatras, and its Baroari poojahs. But where are these things now? Echo answers where? At day time you will find large and expensive buildings either wholly unoccupied or in the occupation of a few old women. Is there a pestilence in the villages? Ah! not for you will see the houses and huts of the peasantry full to overcrowding. It is the houses of the middle class *bhadralokes* that are wholly or partly unoccupied and that gives to the whole village the look of a deserted village." Not only the middle classes but the field labourers also have found their ancestral occupations not sufficiently paying and have felt the need of moving to other places. The Government public works, the factories, the tea, indigo and coffee plantations, the mining operations as well as the facilities for foreign emigration all tend to shake the old immobility of labour. As the Imperial Gazetteer writes: "A comparison of census returns of 1891 and 1911 shows that a considerable landless class is developing which involves economic danger, because, the increase has been most marked in districts where the rural population is already congested or in provinces in which there is a special liability to periodic famines. The ordinary agricultural labourers are employed on the land only during the busy seasons of the year and in lack times a few are attracted to large trade-centres for temporary work."

The attraction to towns and other trade centres increases as trade industries develop and this movement is accelerated in famine years. "Agricultural labourers migrate from Bengal and the Central Provinces to Assam, from the United Provinces to Bengal from Madras and Chittagong to Burma; and outside of India to Ceylon, Mauritius, South Africa, British Guiana and other colonies in search of Agricultural and other employment. In Madras where emigration has been comparatively easy there is almost a chronic scarcity of labour. In a memorial of some landowners of the district Tanjore to the Madras Government, it is said that the agricultural operations have been much impeded and at times endangered by the constant and sudden desertion of agricultural labourers, who after entering into contract to cultivate the lands on certain condition emigrate to foreign parts without the slightest notice to their employers. They pray that facilities for emigration of agricultural labourers to foreign places might be restricted."¹

There are also other great far-reaching effects of this migration of labour. Formerly the landless labourers were solely at the mercy of the landlords who employed them at starvation wages. In the slack months they had to starve. The demand for labour has changed all this. The gumustas and other employers of labour have now to treat the labourers mildly and give them good wages. Agriculture has now improved, when it has been relieved of the excess of labour. On the other hand there has been engendered an aversion for the parent plough and workshop. The demand for labour again, has withdrawn the most valuable and potential elements from the society—the flower of the agricultural population and rural artisans—so that not only agriculture but the handicrafts also suffer. The production of cereals has diminished a great deal while the foreign exports have a continuous tendency to rise. The village market is no longer isolated, the demand for food in any part of India tends also to affect it. The population has increased and the standard of living has also become higher. The cooly emigrants or the middle classes who return to the villages bring with them good savings and live on better

1. G. S. Iyer : Some economic aspects of British Rule in India, page 207.

fare than they were content with before they emigrated. The increased demand for food is however unaccompanied by increased out-turn of agricultural products. The price of food stuffs has consequently risen by 32 p. c. The exodus to towns is still going on at an alarming rate, the towns still continue to offer easy employment to the middle classes and labourers and ready markets for the products of the village artisans. They offer high material prospects to the ambitious and in general provide for all the mechanical facilities and pleasures of life to satisfy those whose standard of life has suddenly been raised. The landlords pass their lives amid the luxuries of the towns, and lose touch with their tenants. The sturdy cultivators become domestic servants and the middle class independent *bhadralokes* become clerks in mercantile offices and government establishments. Thus the villages are all deserted and left as wastes and become prey to malaria. Paternal estates, tanks and orchards which have been handed down from generation to generation are left to decay. The cattle gradually deteriorate in quality. Milk and dairy produce become gradually scarce, and pisciculture and horticulture become unknown. The movement of the population from the village to towns is in fact not only working a complete revolution in the habits and ideals of our people but its economic consequences are far more serious than are ordinarily supposed. It has made our middle class helplessly subservient to employment and service and has also killed the independence of our peasant-proprietor. It has jeopardised our food supply, and is fraught with the gravest peril not only to our handicrafts but also to our national industry, agriculture as well.

The exodus to towns, however, is unhappily the most outstanding feature of our recent industrial life. It is facilitated by railways which afford easy opportunities to travel unknown before. The railways have affected the village economy in another way. By bringing foreign goods they have introduced competition in sequestered villages that for centuries followed custom and paid customary prices.

A money economy further helps the process of economic transformation. The Kababs and other middle men that deal with imported goods are not local people and will not wait for a quantity of grain at harvest time. The men who went to the

(c) The introduction of money-economy.

cities and other trade centres were paid in money and not in kind for their labour. When they return to the villages they come with ready money in their hands. Again, the steady rise in prices of the necessities of life which has been a characteristic feature of the recent economic history of the country has made the cultivating classes more or less independent of the *mahajans* by putting them in possession of an amount of ready money which they never possessed before.¹ Still these are not the sole reasons for which a money system should come into universal use. The system of collecting the revenue in cash is the most powerful cause of the introduction of money economy.

Thus there have in operation several forces which tend to profoundly affect the old Indian rural economy. But the question that presents itself in this connection is, *How far will the influence of the new economic ideas and practices of the West modify this old Indian economic system?*

There are now many facts to show that the process of transformation is not at all accomplished. These facts we can gather from a study of Indian life and labour, specially in the village. Each village has still its potters, carpenters, blacksmiths and weavers who are meeting the village demand together with the manufactures of the west. In spite of the attraction to towns, the people as a mass live in villages. Of India more than any other country it can be said that the nation lives in the cottage. 90 p. c. of the total population of India live in villages whereas in England 75 p. c. of the population live in towns. There are only 2,150 towns in the whole of India possessing not less than 5,000 persons. Even these towns are aggregations of villages, not greatly differing from single villages. There are 190 towns in Bengal which contain only 5 per cent of population. The villages make up the remaining 95. The number of villages in Bengal is about 203,658 counting each so-called towns as only an overgrown village. Of these 165,305 contain under 2,000 souls; and 3,066 over 3,000. Migration or emigration has worked hitherto on such a small scale in India as a whole

Still the self-sufficiency of the Village yet remains, and migration and emigration work on a very small scale. Thus the Village is still the real economic unit of India.

1. Burdwan District Gazetteer, p. 112.

that little relief has been given either to congested or populated districts. The Indian peasant clings to the hood of his own home, however much it may be. Again, "the movement between different parts of India of a temporary nature, and does not involve a permanent change in residence". Statistics show that over 90 per cent of the inhabitants of every district were born in that district 6 per cent were born in the districts immediately adjoining it and only 3 per cent come from more distant places. Thus the self-sufficing isolated village is still the real unit of the Indian social life.

The number of landless labourers who are employed in mills and factories is exceedingly small as compared with the total industrial population¹ of our country.

In the Punjab where a great deal of land has been brought under canal irrigation within recent years and has been colonised by people from thickly inhabited tracts, the census returns show only 3,50,000 labourers and more than 10,000,000 landowners and tenants. Large industries have been established, but the supply of labour has been found to be inadequate. "The tea gardens of Assam are worked, though less and less so as time goes on, by coolies recruited under a system of state-aided and state-supervised emigration under the Inland emigration Acts. The stream of emigrant coolies that used to be poured out to the British colonies under a system of state-aided emigration is now almost counterbalanced by the coolies who return to India."² "The factories are suffering from the inadequacy in the supply of labour. The deficiency has seriously restricted their productive capacity.

1. As H. H. the Gaekwar said: "Very much the large proportion of the Industrial population of India is engaged in indigenous industries carried on in village homes and bazaars. *India is and will always remain a country of cottage industries*, where hundreds or thousands can work in factories millions or tens of millions work in their huts. Any comprehensive plan of improving the condition of our industrial classes must, therefore, seek to help the *dwellers in cottages*. It is the humble weavers in towns and villages, the poorer braziers and copper-smiths working in their sheds, the resourceless potters and iron-smiths and carpenters, who follow their ancestral vocations in their ancestral homes, who form the main portion of the industrial population and who demand our sympathy and help. It is they more than the agriculturists or the mill and factory labourers that are most impoverished in these days and are the first victims to famines. (Inaugural address in the Industrial Conference, 1906.)

2. Economic aspects of British Rule in India.

The deficiency has seriously restricted thier productive capacity.¹ The fact is that the Indian labourer is quite reluctant to leave his village. When however he does leave his village to work in the factories, he does not leave it for good, but he tries to return as soon as he can. As the report of factory commission 1908, says, "The Indian factory hand is primarily an agriculturist. His real home is in his native village not in the city where he works. He leaves both wife and children behind him when he emigrates to the factory and regularly returns to them to look after his family affairs and to rest from his labours. More than this, he can always find work in his village if he gets tired of the factory."

Thus the structure of rural society is being transformed, but the transformation though rapid has been as a whole very small. Indeed the new ideas that have come from the west are so thoroughly alien to the habits and ideals of our people that these cannot be adopted without any danger to our rural institutions. The Indian village will not live if these disruptive ideas begin to influence our social life. But it is impossible that the Indian village can be destroyed. The east is not unchanging. The Indian village had changed with the change in the time. The new conditions which have been introduced in India will inevitably lead to a change but it is hoped that India will remain changeless in that beneath the thin garments of Western influence she will remain true to her own spirit. The change had already begun, the last decade in India has witnessed mighty changes brought about

1. "There is at present one very serious obstacle to the rapid development of the factory system. Labour is very difficult to secure. The Indian labourer does not readily adapt himself to new methods. In factories, in handloom workshops and in coal mines there is the same complaint,—that the wages are higher than can be earned anywhere else and yet there is a strange unwillingness to be tempted by them. In order to induce an Indian workman to enter a factory, he has to be allowed a freedom from discipline which will soften the contrast with his older methods of work. (Prof. Lees Smith, India and the Tariff Problem.—24.) Again,

"At the Raniganj coal mine the labourers will not as a rule work more than half the month. Though they could easily cut two tubs a day they are usually content with cutting one and they take frequent holidays." (Report of the Chief Inspector of Mines, 1905.)

by her contact with the West. As Mr. A. Chatterton has said: "The methods of Western Industrialism are steadily introduced into the old rural organisation of India but they have not yet taken root; the undivided family has to be reckoned with, and the extreme sub-division of property renders productive effort on a large scale difficult; comfort rather than luxury, a moderate rather than vast fortune —these are the ideals of enlightened Indians. In consonance with her character and socio-economic traditions of life and art, the product of centuries of her past evolution, India has not yet accepted the methods of the West nor she will do so willingly. Indeed, it is probable that, in the interest of her self and the world India would strive to move forward to a goal more in harmony with her own traditions than is that presented by western civilisation.

She would pursue a *via media*, and neither adopting wholesale commercialism by replacing her artisan by the machine as is done in Europe, nor leaving the artisan severely alone to his sure and ultimate discomfiture. She would evolve a system on her own lines the object of which should be to employ human labour to the greatest extent and the way most advantageous to the individual man, which would maintain as well as develop her own ideals of life and art, the product of her past economic history. The steps of this gradual evolution have yet to see. The modern phase of transformation is transitional and bound to be temporary because it is characterised by a total severance from the time-honoured indigenous ideals of life and art.

1. "There is no doubt that the immemorial civilisation of the Hindus will undergo change both in its spirit and in its practice under the stimulus of the potent foreign influence to which it is now exposed. Yet I cannot help hoping that the Indian people physically and mentally disqualified for the strenuous (Materialistic) life of the western world will retain long in their nature enough of the spirit of Sadhuism to hold steadfastly to the simple, frugal, unconventional life of their forefathers for which climatic conditions and their own past history has so well-fitted them, always bearing in mind the lesson taught by their sages that real wealth and true freedom depend not much upon the possession of money or a great store of goods, as upon the reasonable regulation and limitation of the desires." (J. C. Oman. *The mystics, Ascetics and Saints of India.*)

SECTION II.

Claims of the Cottage Industry ; General Considerations ; the Ideal of Production.

It has often been remarked that the economic unit in India cannot develop into that complexity which characterises the economic life of the West. Sir Theodore Morison has observed that the Indian economic organisation is one in which it is not possible that the division of labour could be especially in non-agricultural pursuits carried very far. "Owing to the necessities of agriculture, the people are scattered over the face of the country in small villages. These villages constitute self-sufficing industrial units. As the division of labour is limited by the possibilities of exchange, there is no opening in such villages for specialised skill. This is true, however, only to a certain extent. For if one village has a group of artisans who are very fine workmen, their wares may command a large market out-stripping the limits of the locality. Thus every village in our country has its blacksmiths and coppersmiths and also its jewellers, who carry on their business on a small scale but in some villages these local industries have attained considerable magnitude, such as the manufacture of copper and brass vessels at Srinagore, Benares, Mirzapore, Lucknow, Moradabad, Jaipur, Poona, Nasik, Bijapur, Madura, Vellore, Mysore, Rangoon. Similarly the silversmiths and jewellers of Srinagore, Multan, Lucknow, Jaipur, Cutch, Ahmedabad, Poona, Bangalore, Madras, Cuttack, Calcutta, Rangoon, and Moulmein are famed all over India. (The Imp. Gaz. Vol. III, p. 234.) Specialised skill, therefore, if it is highly efficient finds for itself a ready market outside the limits of the locality. Indeed the market which our domestic industries commanded in the past was not confined to this country but extended beyond its frontiers far into the West.

India had never been a land only of raw produce. From the very earliest times she enjoyed an industrial supremacy sending the products of her domestic industries to the West and receiving in exchange the precious metals which went to constitute her proverbial wealth. For centuries, indeed, had she been able to maintain her proud position as the Queen of the Orient, commanding the markets of the world through sheer superiority of workmanship of her craftsmen. But the repressive commercial policy of the E. I. Company in the

18th and early 19th century coupled with the invention of steam power has produced a vast transformation. All our domestic industries have been threatened with imminent extinction. The rush of the steam-engine and the whiz of electricity, combined with cheap and easy means of transport have well-nigh succeeded in making our country a dumping ground for the manufactures of all nations.

We have to oppose this overwhelming flood of manufactured goods for our very existence. But how shall we compete with the West? Shall India adopt wholesale the method of Western industrialism? Would we adopt wholesale the methods of industrialism of the West which have been accompanied by so much social and economic evils?

In fact the methods of manufacture as they are at present in the West will not suit our socio-economic condition. In the mad struggle for competition let us not forget that India is still and her material production must be controlled by the spirit of her real self.

Production not the end of civilisation.

"The true end of material civilisation is not production but use, not labour but leisure, not to destroy but to make possible culture. A nation which sees its goal rather in the production of *things* than in the lives of *men* must in the end deservedly perish." ¹ "Already all over the Western world the problem which with ever increasing urgency demands a solution, if peace and progress are to be preserved is that of the persistence of undeserved poverty in the midst of abundant wealth, of unemployment in the midst of unsatisfied desires." ² Again, "Never before in our history was the misery of the very poor more intense, or the conditions of their daily life more hopeless and degraded; the vast wealth which modern progress has created, has run into pockets; individuals and classes have grown rich beyond the reach of avarice, but the great majority of the toilers and spinners have derived no proportionate advantage from the prosperity which they have helped to create." ³

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1. Dr. A.K. Coomaraswamy's essays in National Idealism, p. 155.
 2. Max Hirsch : Democracy vs. Socialism, Introduction.
 3. Mr. Joseph Chamberlain.

According to a recent estimate 125,000 families of the wealthy class in the United States and hold 33,000,000,000 dollars of the total wealth of the nation, while 5,500,000 of the poorer classes possess only 800,000,000 dollars. To put it in another way in every hundred families of the nation family holds more than the remaining 99. Nearly half the families of the nation are classed as "propertyless," i. e. having nothing save clothing and household furniture. (Spahr. essay on the present distribution of wealth in the United States.) This inequitable distribution of wealth, of material well-being, this practical exclusion of the masses from the greater part of the benefits and enjoyments of modern civilisation is creating everywhere the most dangerous discontent among the labouring classes and is awakening among the philanthropists and statesmen the greatest solicitude and apprehension.

Prof. Giddings of the Columbia University has thus pointed out the serious dangers, of what he characterises as the "startling contrasts of civilisation". The enormous disparity of wealth in which a highly organised industry has resulted is clearly revealed to every eye. Into this dangerous combination of conditions, enters the demoralising factor of personal degeneration. Many of

In some countries in Europe real well-being has been sacrificed in the interest of concentrated production. A highly organised industry has resulted in an enormous disparity of wealth that has created unrest and caused grave social evils.

the rich, though happily not a majority, surrender themselves to the mad struggle to get money that they know not how to use, to achieve notoriety even though it may be scandalous, to accomplish anything if only it surpasses everything that has hitherto been imagined. Consumed with a sense of their own importance, the degenerates of this class become more and more exclusive. Living at the centre of the throbbing life of humanity they affect to ignore its passions, its sorrows, its joys. They seek to cut themselves off from all part in a work-a-day-world. On the other hand, many of the poor, though happily not a majority, give ear to anarchism, withdraw themselves as far as possible from contact with the rich and cherish the hope of organising the proletariat into an irresistible force and taking possession of all the organs of Government. Thus, he concludes, "civilisation is menaced by dangers perhaps as grave as those that overshadowed it at the beginning. It was threatened then by the barbarism beyond its walls. To-day it is threatened by the *savagery within its gates*".

The over-crowded filthy cities, the depopulation of rural districts, the enormous disparity of wealth and the consequent conflicts of labour and capital and chronic social interest, the inevitable evils of the factory system have, in fact threatened the very foundation of the western society. The people in the West have begun to think seriously what the Chinaman said to them: 'Your people are no doubt better equipped than ours with some of the less important goods of life; they eat more, they drink more, but there their superiority ends. They are less cheerful, less law-abiding; their occupations are more unhealthy both for body and mind; they are crowded into factories divorced from Nature and ownership of the soil.' Everywhere indeed an in-

The cry of Socialism. creasing desire to once more relate the life of the people to the land is clearly manifest and the domestic system of industry is being revived and re-established.

A recent German economist has thus spoken of the new age of idealism that is coming in modern Europe.

"Mankind up-to now has not known how to put the riches it has gained to the best possible use. But he who has eyes to see and ears to hear can feel the new age approaching, with newer ideals that fall like sun's rays on the heart of the present generation. We are tired of the material prosperity, which our fathers made for us, and of which they were so proud. We want something else. We want a different kind of culture, in the next age. Idealism will take the place of Materialism and mankind will be healthier in body and soul."

In the face of all these, let us not introduce the system of labour in the factories without introducing fundamental modifications into it. Let India adopt the factory industry not in the lines of the west but adapt it to her own ideals and socio-economic conditions. We cannot dispense with factory production, for under certain conditions of supply and demand it is economically inevitable.

A large proportion of the commodities required for our consumption will doubtless be made in the factory. Wherever there is a steady demand for the same class of goods, where fashion does not fluctuate or the individual taste of the consumer is not potent,

machinery will inevitably supersede hand-labour. In the production of commodities of precisely the same shape, size, colour and material which are not durable and in which therefore artistic developments are altogether superfluous machinery will always excel because of its obvious advantage in the increased output of motive force it can apply to industry, as well as the greater precision in the application than in the case of handpower. It is easily

Conditions where the Factory System is Inevitable.

seen that the satisfaction of the primary animal wants,—hunger, thirst, cold &c. are common to all; in these purely physical demands there is less qualitative difference in different men: as the needs are the same, the consumption will be the absence of wide individual differences of taste, indeed, marks out the commodities for routine or machine-production. As individuals are nearest alike in their prime physical needs so, as they gradually develop higher material wants, and after these are satisfied, æsthetic, intellectual, moral wants,

When commodities of the same pattern are produced to meet a large and continuous demand e. g. industries engaged in satisfying the physical and routine needs of men: (Hobson.)

their individualism becomes more and more marked. It is therefore in the most highly developed or, as they are sometimes called the more 'artificial' wants of men, that the diversity of individual nature shows itself most strongly, and demands a satisfaction peculiar to itself which only art can give. In a highly evolved society it is likely that many physical needs, and even some intellectual needs, will be common to all and will engage like individual attention. They may be regarded as routine-wants and will be satisfied by machine-made goods. Indeed it seems reasonable to expect that on the whole machinery will retain and even strengthen and expand its hold of those industries engaged in supplying the primitive needs of man, his food, clothing, shelter and other animal comforts. Again, industries in which a disproportionately large amount of durable plant is necessary, cannot be run profitably except on large scale. Thus in many branches of the metal and transport trades no business can be started except with a large capital. The railways and water companies, those that own canals, docks and bridges are always large businesses and tend to be concentrated in fewer hands. (Masshall's Principles of Economics, p. 693.)

The small scale business under these economic conditions results in a waste of efficiency, labour and skill which should

always be deprecated. Indeed in the interests of efficient production which alone can give the leisure as well as satisfy the conditions of healthy and complete living, production on a large scale under certain economic conditions is equally necessary with that on a small scale. But it should always be remembered at the same time that economic efficiency is not the end of civilisation. It is only a proximate end and therefore works within the

The Economic world only
a means :

limits of and in subordination to the governing end, which is complete and healthy living, culture in the highest sense of the term. As Professor Henry Jones has remarked, "the industrial world presupposes, exists within

It works within the limits
of larger ends, Culture and
Noble Life.

and in virtue of, a wider social order whose interests are as multifarious as the desires of man, and which is indefinitely richer in ethical content. At its best it is *only a means and instrument* and can supply man with only the raw material of his real life. Its value does not lie in itself, but is relative to its use, and depends upon the kind of satisfaction which is sought by means of it." For, after all, the purely economic world is an abstraction and the purely economic man is a fiction. After a man gets his living he has got to live : thus industrialism does not comprehend the whole of life. Wealth is not adequate to the perfecting of culture : culture, as a recent writer puts it, is the appreciation, not contemplative alone but active and efficient, of the non-economic values. And if the measure of a nation's true success is its culture and higher life, the amount it has contributed to the truth, the moral energy and intellectual happiness, the spiritual hope and consolation of mankind (Lowell) the West cannot face this just criterion boldly. Wealth has no doubt increased astoundingly, but has culture increased ? It is significant that many writers unless in Europe & America are now dreading a wide remission of enthusiasm, for high moral ideals. In a forcible article on the decline of culture, E. Benjamin Andrews says, wealth-gaining

The Decline of Culture, in
the West.

is an obtrusive, all-engrossing phenomenon over shadowing all else,—massive, ubiquitous, obstreperous, never out of sight or out of mind. By its size it occludes the Sun: the noise of it deafens reason's ear. We do not refer namely to those professedly engaged on amassing riches; the

frenzy spreads to all. If any perchance ask how much one must have to live on comfortably, the chorus answers at once: "The utmost you can get." It was said by him of old time "Life is more than meat;" the modern criterion would seem to be that life is dential with meat, and the body with raiment." The West has still to distinguish between wealth as means and wealth as an end. Her faith has to be reformed. Perhaps she will have to wait for another Messiah. In the meanwhile let her not force her present ideal of production on the social system of the East.

Asia's Question to Europe.

The venerable East still distinguishes between means and ends. Rightly has Okakura-Kakuzo asked, the West is for progress, but progress towards what? When material efficiency is complete, what end asks Asia, will have been accomplished? When the passion for fraternity has culminated in universal co-operation, what purpose is it to serve? If mere self-interest. "where do we find the boasted advance?...Size alone does not constitute true greatness, and the enjoyment of luxury does not always result in refinement. In spite of the vaunted freedom of the West, true individuality is destroyed in the competition for wealth, and happiness and contentment are sacrificed to an incessant craving for more."

There is in western society a wide-spread contempt for the simple

Ethical dangers of Western
Industrialism, of the system
of Concentrated Production.

life, a falling off in men's desire to promote the things of the mind. Charles Wagner says that there is in modern society not only less thought than once of ideals but less mobility of mind as well. In ancient society, the people had variety in uniformity; in modern society they have monotony in the midst of change. Industrialism and fashion tend to crush out all originality, and flatten individuals into specimens. "The city possessing the engines of civilisation floods the country with its products, beating down and running out local peculiarities, local manners, costumes, provincial songs and idioms disappear. Towns and villages drained debilitated, each show of its individuality are but the feeble images of cities. Professor Royce rightly points out the mischief of this bleaching process pointing out the incalculable benefit to the national character of local idiosyncrasies." "Industrialism, again, involves another curse, the division of labour as destructive of spiritual as it is creative of temporal wealth, and not confined any longer to mills and shops but felt as well on 'change at the bar,

in newspaper makings and even in teaching. Everywhere specialisation breeds pettiness, an arid mind, thinking with the spinal chord instead of the brain. Thus the modern phase of industrialism in the west is tending to destroy the very roots of culture and originality, thus defeating its own ends. But while we should

Where Production on a Small Scale is an evil danger in the opposite extreme.

deprecate the present tendencies of the Western system of industry, we cannot at the same time ignore the dangers of production on a small scale, the characteristic feature

of our social and economic life. While in some countries in Europe real well-being and culture have been sacrificed in the interest of concentrated production and large scale industry, in the lands of small industries, Belgium, Italy, Austria and India as well, well-being has been equally sacrificed in other directions. The craftsmen in these several countries follow the same monotonous process of production with an unrelenting and severe drudgery that kills both body and spirit. Skilful as they are in a particular groove, they are deficient in general intelligence and lacking in that originality and initiative which alone can give vitality to a craft. There is in fact no fund of inventiveness on which to fall back in times of stress, no exercise of artistic power and individual

The unrelenting and severe drudgery of craftsmen; their lack of originality.

judgement which can save the art from being stereo-typed. In fact the essence of the real handicraft, the thinking power of artisan imposing his personality upon the

handi-work is lost. Life becomes a routine and the individual more or less a machine without rising to the life of a self-conscious reflecting intelligence. India should have to steer clear of the excesses of the two methods of production and sub-ordinate them to the purposes of a higher, nobler existence. If she is to develop industrially, let her adapt these methods of production to herself so that they can minister to the higher needs of men *as well as* satisfy the immediate necessities of life. Let India *modify the factory industry as she introduces it into her own social organism* and let her not at the same time forget her ancient domestic industries but let her reform them on altogether new lines. But in the wake of the material aggressive civilisation of the west have come to India the western art ideals, which in at moment of passionate admiration for the success of the Western

methods of life have been welcomed by India. And India has allowed herself temporarily to forget the life ideal which she had been following through the centuries. The domestic industry is being annihilated everywhere in India and the cruel and inartistic method of applying mechanical power is adopted in close and distinct imitation of the Western system of manufactures.

In spite however of the gradual supersession of the small by the large industry all over our country, spoken of above there is no fear of complete extinction of the hand-industry in the competition with the factory. The small industry has always certain monopoly advantages on account of which it has lived and will continue to strive side by side with production on a large scale. As it has been well said: a study of the evolution of industry will reveal the fact not sufficiently recognised that *pari passu* with the development of scientific industries on a large scale there is always a corresponding development of subsidiary

There is always a place for the small industry which cannot be filled up by the large industry.

as well as independent smaller industries, including handicrafts, art industries and home-industries. This is well illustrated in the modern industrial history of European countries, specially those on the continent. In fact, it is a fallacy to suppose that natural selection in industrial evolution is only a process of large organisations surviving and weeding out the smaller in the struggle for existence. In the industrial world, 'fitness' does not depend on size alone but is determined to a large extent by adaptability to environment and by the conjuncture of circumstances which the organisation has to utilise. In this way *there is always a place for small industries in the course of industrial development*, a place which can never be abolished but will always continue to exist, simply because it cannot be filled by large industries."/>

For the latter presupposes certain economic conditions which are not universally realised.

It has always to be borne in mind that a factory industry presupposes certain economic conditions which are by no means universally realised. The demand for the goods must

have to be not only wide and large but steady and continuous as well, otherwise the organisation of business will be found unprofitable. Another condition presupposed is the growth of capital, not only in the form of machinery but also in the form of means

The conditions (a) as regards Capital,

of communications and exchange. Only the improvements in machinery as well as the mechanical skill necessary to run it can make specialisation and organisation technically possible, while

the railways, telegraph, and the banks widen the markets and make such organisation economically possible. Again, another main requirement of the employment of machinery or large business is that the different processes of production shall permit of being carried on simultaneously. Indeed, this feature of industry is almost entirely lacking in what may be called the 'culture industries',—agriculture, sericulture, horti-culture or pisciculture, which have therefore defined all attempts at minute specialisation.

(b) The Nature of the Industry

Even here also certain cultural products have been laboratory and manufactured products through the achievements of organic chemistry. Again, the production of quickly perishable commodities is of necessity local and cannot economically be undertaken by machinery. Thus the work of the dairyman, the baker and the butcher cannot be largely aided by machinery except when preservative processes have been discovered or facilities of means of transport established. It is further doubtful whether the large scale producers can secure that minute and economical supervision which characterises the small industry. The ownership and control being combined in a single man in case of the small industry, the small producer shows a zeal in the business which is absent in the director of a large establishment. It is sometimes claimed by experts that in many lines of business, a plant of moderate size is the plant of really maximum efficiency in regard to capital and labour costs. The small producer, again, has a distinct advantage in his greater power to know the personal wants of his market.¹

(c) The Character of the Demand.

He is in a far better position to consult and satisfy the individual tastes of the consumers than his greater

1. Dr. Marshall has observed : " Of two businesses competing in the same trade that with the larger capital can nearly always buy at the cheaper rate, and can avail itself of many economies in the specialisation of skill and machinery and in other ways which are out of reach of the smaller business ; while the only important special advantage which the latter is likely to have consists of its greater facilities for getting near its customers and consulting their individual wants."

rival We have already pointed out in the preceding section that perfection of routine work being the special faculty of machine production, machinery cannot undertake the work where fashion fluctuates or the individual taste of the consumer is a potent factor. In many industries the personal element plays so large a part that the small producer will for a long time hold his own even if he cannot oust the large producer from the field. This is

Case of art' industries, industries, which satisfy individual needs and tastes as distinguished from the routine needs of men.

especially true of fine arts and the decorative industries which are therefore far more suitable to hand-labour than to the machine. Again, even in the region of ordinary material consumption, in the more skilled branches of shoe-making, tailoring and other clothing trades, the individual character of the demand, *i. e.* the element of 'irregularity' has limited the use of machinery. A similar case retains human motor power in certain cases to co-operate with and control machinery, as in the case of the sewing machine. If the wearing public consent to wear clothes conforming to certain common patterns and shapes which are approximate "fits", machinery can be used to make these clothes; but if every person requires his own taste to be consulted, and insists upon an exactitude of fit and a conformity to his own special ideas of comfort, the work can no longer be done by machinery and will require the skill of an "artist". It

Machine vs. Hand-labour.

is precisely upon this issue that the conflict between machine and hand-labour is fought out. As long as the consumers refuse to conform to a common standard, hand-labour cannot be dethroned from industry, and in proportion as they develop individuality of taste, handwork or art will play a more important part in industry, repel the further encroachments of machinery every or even drive it out of some of the industrial territory it has annexed. But the highest division of labour which will apportion machine to the supply of the routine needs of life and art to the supply of individual needs and tastes, constantly growing and changing in variety, has not been yet attained in industrial life and organisation.

There are also a few other factors in favour of the small industry which are particularly true of India. In the rural tracts

of the country large markets are more or less unknown and hence there is small scope for the large industry

Conditions favouring the small industry in the rural tracts of our country.

The circulating capital being small in amount in these tracts, a small industry

which requires but a small initial outlay is to easier start. Though skill and machinery cannot be specialised, the small industry will be able to train good all-round workmen. It will also be able to offer low prices the cost of carriage and transport being saved as it would supply only the local wants. The commodities manufactured by the small industry, being in general demand and not subject to changes in fashion, the sales are fairly large while the necessary stocks are small, and the capital invested in the industry can be turned over very rapidly with little trouble and no risk. Again the conditions of our agriculture leave the cultivators out of employment for several months in the year. This vast amount of surplus labour might be utilised in favour of the home or cottage industries in our rural areas where their raw materials are abundant and the markets near as well as sure.

SECTION III.

Tendencies of modern industrial life in the West and their lessons for India.

We have already seen that in many branches of industry, the cottage system is not only inevitable but has no rival. Its place cannot be filled up at all by the large industry. We now come to those cases in which the small industry and the large industry compete with each other in producing the same goods. The large industry can in these avail itself of avail economies out of reach of the smaller rival, but these now tend to be counteracted, in favour of the small industry, by the recent developments of applied science in the West. Modern inventions in engineering science are revolutionising the choice and methods of distribution of power, neutralising the advantage of the large scale industry in the matter of concentration of power.

Hitherto science in the West enabled the big manufacturer to crush out his rival small manufacturer. Recently, however, science is used not to discomfit but rather to fortify the handicraftsman against

the capitalist manufacturer. "Those who have followed recent

Recent developments in applied science place the artisan using a small power in a much better position to compete with the larger user of power than was possible a few years ago.

developments in Europe cannot be blind to the fact that within certain limits the progress of applied science is rapidly tending to extend to the small workshop and the individual craftsman the advantages which

since the introduction of steam power have been the monopoly of the capitalist." ¹ Indeed the prospects of the small manufacturer have improved a great deal. There are greater prospects of the small manufacturer being able to compete with the big than there were a few years ago, as recent progress in science and the mechanical arts has done much to raise the efficiency of working on a small scale. Not by any means in all directions but in some and those more particularly which are likely to flourish in India. *The cost of power has been commonly reduced especially in the case of small plants, so that the small user of power is now in a much better position to compete with the large user than was possible only a few years ago.* There is in consequence a perceptible re-action against production on a large scale and a tendency to make greater use of the elasticity which allows small works more readily to adapt themselves to changes and fluctuations in trade, cyclical or otherwise. ² There is in fact at present

Consequent movement in the continent of Europe in favour of the small industry.

a movement in Europe in favour of the small industries. The Govt. of Austria has for

many years been spending large sums on the development of the domestic handicrafts with the result that in many villages and small towns throughout the empire women and children are making imitation-jewellery and quantities of small wares chiefly for export to India. Holland has also developed a lucrative industry in hand-painted cloths, following in every details the technical methods of the cotton printers of Masulipatam or elsewhere

1 E. B. Havell : Indian Administration and Art and Crafts in India, Hindustan Review, April 1909.

2. Alfred Chatterton—The Indian Industrial Progress. Science and Progress, 1910.

Germany and Italy also are now following Holland's example. The Govt. of Roumania also has in a few years by the aid of technical experts built up a most prosperous domestic industry of over 12,000 looms which holds its own most successfully against powerloom mills. The Govt. of Hungary has for some years been supplying machinery to independent craftsmen (master workmen). Between 1899 and 1,909, about 1,922 craftsmen were supplied with machines of the aggregate value of 37,62,567 crowns. Only in 48 cases the machines had to be declared forfeited, because the craftsmen in question were unable to use them or keep them permanently working. Out of 1,922 craftsmen 434 work in iron and metal and 390 in clothing industry. A considerable number of machines has been supplied also to co-operations, 219 cases in all. The measures taken by the state for the development of industry have been remarkably successful, the proportion of failures being a very small one, whether we take manufacturing industry or independent craftsmen. (Alexander de Hollan, *Economic Journal*, March 1911.) Thus while Austria, Holland and Germany and Italy are developing profitable handicrafts at India's expense, the Indian handicraftsmen are being driven to agriculture or into the factories of the capitalists both for want of efficient instruction and organisation.

Indeed throughout Continental Europe mechanical force on account of the most recent developments in science, has been applied not only artistically but even more effectively in the cottage rather than in the factory system. The cottage industry uses small motive power and is thus cheaply or effectively able to compete successfully with the factory system. And it would indeed be a most mistaken economic policy in India to break up our old organisation of rural industry and encourage our artisans to leave their trades when the adoption of the latest developments in science would enable them to use mechanical power quite as easily as the mill-runners. Let us, on the other hand, rehabilitate our domestic industries and reorganise the trade-guilds and industrial castes by adopting the mechanical improvements as are needed in their present condition. The two elements which are now wanting in our domestic industries are the motive power and the machine tools. The artisans who are capable of laying out small capitals can with comparative ease procure for themselves the second at a moderate price; but hitherto it had not been the same with the

first. The carpenter, if he is furnished with a very cheap motive power which is necessary to set his circular saws and other machine tools in motion will be able to work in his house as well as a great manufacturer. In this way he will be able to utilise his small group of machines in a variety of ways, until he will begin to acquire a perfect command over his work which he could not have been able to attain, if he had been a workman in a great factory. In spite of the advantages on the side of the big manufacturers the small manufacturer will be in a position to compete with them. He will find an energetic support in the collaboration of the members of his family and in the moral element which will be the consequence of the work in his proper home. He will form a number of assistants and apprentices, or, in fine, a complete industrial organisation quite analogous to that of the ancient professions, but differing from it only in the introduction of the machine. The improvements of applied science can

Electric power can be
cheaply transmitted to cot-
tages.

now supply him with the motive power at a very small cost. The modern developments of the use of electricity might now transmit motive power cheaply to the cottage of a small producer. The electric installation is not only less expensive but also relatively more productive than the steam-installation. The economic advantage of the larger over smaller installations is not so great as in the case of steam, while the absolute productiveness is greater in the case of electricity. Thus the electric installation has one tendency to take large dimensions. The advantage of storing electric energy in batteries is considerable especially to a craftsman whose work is intermittent. Again the motor can be used even by the most unintelligent. By the inventor's skill, the mere pressing of the button sets it going while any chance of accident is removed by safety appliances. Again, there have been several petty motors which have proved very successful in the West. The most satisfactory types of them are the water pressure engines, the gas or oil-engines. The latter have now become the formidable rivals of the steam-engines, and even very large sizes are now tried. It cannot indeed be doubted that gas will give steam only a subsidiary place in future. The small petrol engine of motor cars have great advantage and they have been improved a great deal. Their peculiarity of having little

bulk and proportionately large power has made them useful for a variety of purposes, *e. g.* lawn-mowers, pleasure-boats, aeroplanes etc. As regards the respective advantage of oil and gas engines, the relative cost of coal and oil has an important bearing on the question of economy of the two types. The cost in the case of oil-engines is five times that of the gas engines, yet the popularity of the former has been steadily increasing, for reasons such as less consumption of water, less attendance, less risk of break-downs, less space, less upkeep, less fuel wastage at starting and no nuisance of smell, etc. In industries where continual working is needed, gas is more convenient. But in most cases, where the load factor is low, say 50 hrs. ; oil-engines are much more suitable. The best oil-engines at full load use 4 lbs. of oil per Brake Horse power, while the best engines will take about 8 lbs of coal. These machines can, in the limited sphere of action from 6 to 3 horse-power, contend successfully with the steam engine. Their work is cheap, thus they are the veritable motors of the people carrying with them the germs of complete transformation of the Small Cottage domestic industries. By adopting such motors, we can give our artisans working in cottages the motive power under fair conditions of economy, practically equivalent to those which secure to the capitalist the steam engine of great power, revive by this means the domestic industry where it exists and re-establish it where it has disappeared.

" If we use the gas in an engine it is possible to get a good economy. The reason is easily seen, when one realises that the fuel is burnt in the cylinder of a gas engine and not under a boiler, which makes steam to deliver to an engine. In the latter case we have the efficiency of the furnace and the inefficiency of the boiler, as well as the radiation of the steam pipes and cylinders, items which do not appear in the heat balance sheet of the gas engine.....Again, we may use oil as a fuel for firing a boiler or for driving an engine. As regards the efficiency of the engine as compared with the steam engine, the one is 34 p.c. as compared with 9 p.c. of the heat value of the fuel". (The choice of Power : By Mr. S. T. A. Mills, A.M., L.M.E., Indian Trade Journal, May 16, 1912.)

"Tendencies of Engineering Science", by A. Sen The Indian Guild of Science and Technology, . . 3.

If the craftsmen are unable to use the small power or the mechanical tools on account of the want of capital, let them adopt cooperative methods. By cooperation, again, the small producers

These motors can be purchased by cooperative methods.

can secure much the same opportunities as to invention and improvement of processes and utilisation of waste which regularly inhere in large scale industry. Thus the advantages of large scale production are secured while the small producers do not sacrifice their autonomy, initiative and personal interest. As Charles Gide

Co-operation in Industry.

has observed, cooperative association—under the different forms of productive associations, societies for the purchase of raw materials or for the sale of finished goods, or societies for mutual credit,—aided by the mechanical inventions that are substituting electric power for steam, and enabling us to transport motive power from the place

its generation to the place of its application, will permit numerous new forms of industrial enterprise capable of resisting successfully the encroachments of large scale industry. Devices for distributing motive power can also be availed of by the small producers by means of cooperation and this will place them on a plane of equality with large concerns, as regards the cost of power

Let us thus reorganise our methods of production bringing back to our midst old ideals of life and art which we are abandoning for those of the West. Apart from the question as to which of the two ideals is the superior let us remember that no industrial ideal which has not its origin in the racial characteristics of a particular people has any chance of being followed successfully. Let us therefore forego the attitude of snobbishness which leads us to imitate without consideration. While we adopt Europe's experiments, let us preserve the exquisite styles and patterns of our own country, our own artistic traditions and industrial ideals, remembering that the revival of industry can come only from within. I must be from India herself, along the ancient roadways of the race that the great voice shall be heard: Victory from within or death without. And when the ordeal is past and the victory won who knows that one day it may be the mission of India clinging fast to the philosophic simplicity of her ethical code to solve the problems

that have baffled the best minds of the West, to build up a sound economic policy along modern scientific lines and at the same time to preserve the simplicity, the dignity, the ethical and spiritual

India's Mission to the World. fervour of her people. I can conceive of no loftier mission for India than this, to teach philosophy to the West and learn its science, impart purity of life to Europe and attain to her loftier political ideal, inculcate spirituality to the American mind and imbibe the business ways of its merchant."¹

Already a new philosophy of energism and active life has been developed in the country which involves a profound intellectual revolution. The creed of inactivity and quietism,² so long favoured by Indian ethical sentiment is not accepted now. New national forces have been awakened and the social life stirred to its inmost depths. Modern scientific achievements of the West are no longer unfamiliar to the people. On the other hand, the people are adopting Western methods and processes, and are rivalling the West in scientific mastery. But if the country is to adopt the philosophy of energism, it does not, after all, follow that it will change its most underlying and essential ideals.

1 H.H. The Gaekwar of Baroda's inaugural address. (Industrial Conference, December 1906.)

2. Renunciation still remains the highest virtue. But it is more than weakness and self-deception for it presupposes a mastery of the world of fact and action and requires the power to rise superior to ordinary struggles and ambitions. Through mental energy and understanding of the world only can such mastery be acquired. "Concentration, calmness and inactivity are the result of centralisation of great powers,—calmness is the mother of tremendous energy," these words of Vivekananda express that "valuation which sets mental strength high above all mechanical contrivance, which appreciates that by the side of the thought-energy of the human mind everything else is significant." This is the greatest paradox in philosophy that the West, where man first became conscious of his powers, where he learned to master the forces of nature before which the oriental peoples bowed down in awe, should invariably have to yield to the Orient in appreciating the intense power of that very human mind and its activity."

"Make yourself strong so that you may retain the right to be yourself," that seems to be the temper of China, Japan, and India; and the self of the Orient is now, and intends to remain, highly spiritual. Mastery over external nature, indeed, attracts as part of the regime of energy or activity, but to the Orient the spirit of man, the mysteries of his psychology, the grandeur of the limitless vistas of development of which the human soul is capable and the heights to which it may attain, are more fascinating than any of the phenomena of external physical nature. It is to orientals a source of great inspiration and enthusiasm to think that they are called to give to the world, and to perpetuate in it, this noble spirituality. They have come to recognize the merits of the West, its high individual development, its energetic activity, its clean and successful methods, its complete system of machinery; but they also well understand that the human spirit does not come to its own with all this efficiency and outward success, that machinery kills souls, that mechanism destroys spirituality. When they see the West striving to introduce mechanical ideas into the most sublime realms of thought, standardising everything upon the basis of computed units of efficiency, they feel the Orient still has a message to the world that will be heard. It is from materialism that they hope to bring salvation. The manner is not yet clearly seen; but as the West glories in its efficiency, so does the East draw comfort and confidence from the thought that its *Spirituality is to be the salvation of the world*. This destiny it can fulfill only if its newly aroused energies are directed to the achievement of aims that have a spiritual meaning and value.¹

1. Paul S. Reinsh: *Energism in the Orient*, The International Journal of Ethics, July 1911.

SILK IN INDIA.

BY

M. N. De Esq.

Sericultural Assistant to the Imperial Entomologist, *Pusa*.

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Silk is the strongest, most elastic, most lustrous and most valuable of all textile fibres. The thread is composed of several finer filaments thrown out by the silkworm from two large silk glands in their stomach which nature has provided it with; when it is mature liquid silk comes out of the mouth through two microscopic holes and as soon as it comes in contact with air it becomes solid. The worm envelopes itself with this thread and forms its cocoon to protect it from harm in the pupa or chrysalis stage when it lies dormant. After certain period it changes into moth, pairs and lays eggs which hatch once to seven or eight times in a year according to race and climate. The one-brooded races (univoltine) which yield superior and large quantity of silk are generally reared in Italy, France, Hungary, Japan, China etc. while the many-brooded races (multivoltine) which yield inferior and less silk are reared in India (except Kashmir) Siam and Anam etc. Raw silk or reeled silk is made by putting the cocoons in hot water and drawing filaments of 6 to 20 cocoons into one thread on a reel. There are some races from which one uniform single thread cannot be drawn and hence they are carded and spun like cotton thread; the thread from these is called spun silk. There are various kinds of silk such as Mulberry silk, Tussar silk, Eri silk and Mooga silk. Reeled (Mulberry) silk is finer and more costly.

Dr. Balfour states in the Cyclopædia of India that there seems to be no doubt that China is the country where the product of the silkworm was

History, China.

first used as a material for textile fibres and that the industry has gradually radiated from China as a centre till it covers at the present day a number of very widely distributed areas of very

diverse climatic conditions. The Chinese historians carry back the cultivation of the Mulberry to the period of myths. If they are to be believed, the art of silk reeling, in China, was known in the time of Fouli-lir, a century before the date usually assigned to the Biblical Deluge. We read that even the Empress Siliuguchi wife of celebrated Hoangte (2602 year B. C.) did not disdain to share in the labours attending to the care of the insect as well as in those of the loom, the invention of which has been attributed to her. In fact she is looked upon as tutelary genius and has special altars of her own. A series of Imperial Edicts and voluminous literature of practical treatises testify to the importance of the industry and the care taken to foster an art which is considered by M. de' Rosny to be best fitted to promote the morality of the people and extinguish pauperism in the Empire.

Historians do not tell us at what period silk was first utilised

in India. The date of the introduction of
the silkworm into India has been the subject

Indian origin.

of some research and discussion by Pariset de' Rosny and other writers ; but the question still seems an open one. A Sanskrit word Kausheya or Koushika meaning silk occurs in the Rigveda, the Ramayana, the Mahabharata and the Laws of Manu. While all due deference is to be paid to the opinions of such eminent people as Prof. Balfour and others one is led to suppose that India may not after all be indebted to China for the introduction of silk here. We see that when performing religious ceremonies it is enjoined that silken garments should be used in India. This points to the fact that probably silk, from very ancient times, has been indigenous here. Even in the oldest Scripture (the Rigveda) we read that the bride is to worship the fire decked in silken cloth. The Rigveda was compiled 4500 to 5000 years ago according to R. C. Dutt.

Moreover when we examine critically the different varieties of Indian silkworms we find that many are quite distinct from the Chinese varieties. Among the recognised castes we find that the caste of the silkworm rearers (Pandas) is quite wellknown from old times.

All these point to the probability of an independent origin of the silk industry in India.

Coming to times later than the Vedic period it is of interest to note that in the Ramayana the first edition of which was penned about 1900 years before the Christian era, Sita at the time of Swayambara is described as apparelled in a yellow cloth of silk. The daughter of the King of Videha received among other gifts soft silkeloth; the ladies sumptuously arrayed in silks welcome the arrival of Sita. The corpse of the King of Dasarath is wound in silken cloth. The great lawgiver Manu describes how silkworm rearing and cocoon reeling were done in India in his age. From the Mahabharat we know that silks and brocades were presented to the Emperor Yudhisthira by the Maharaja of Kaushikikaccha (near Malda) at his Rájasuya Sacrifice.

India held the first position in the world in the silk trade for ages together. The Indian Agriculturist of November 1st 1906 says: "Long did the opinion prevail that China was the great and original country for silk. But the researches of botanists and mercantile men in the present age have thrown a light upon the subject which has tended to explode and expose the error of that opinion. It has now been found out that silk is as much indigenous to China as to India and Burmah; more than this, India produces a greater variety of silk than China. Like silk the tea plant also was thought to be a special *vegetation* of China until it was found to grow wild in Assam. The great silk region in the kingdom of nature has been indicated to extend from China to India in a South West direction—and the fact is that these two countries have for centuries been the contemporaneous cradles and seats of silk and silk manufactures, developed separately by the independent genius of the two nations."

Silk manufactures as well as the art of obtaining the material were known to Indians at a very early period. In the second century of the Christian era silk used to go to Rome from Barygaza, Usiris and other parts on the Malabar coast through the Red sea. The trade in silk constituted one of the three principal trades of ancient India with the Romans. The courts of the Greek Emperors of Byzantium who vied with the sovereigns of Asia in grandeur and magnificence were richly decked in silks. The

these facts. According to Monsieur Boitard, a French writer, two Byzantium monks smuggled silkworm eggs from Serindh a neighbouring province of the ancient Kingdom of Delhi but according to many writers they smuggled the eggs from China to their native place in the 6th century from where the industry spread to Sicily, Italy, France and Spain in the 12th Century which have become formidable rivals and competitors of India. The Caliphs of Bagdad kept up a demand for the silk brocades of India in the place of the Roman and Greek Emperors; and Bagdad became the market that Rome and Constantinople had formerly been in the 13th century. During the sovereignty of the Moghul emperors (specially Akhbar) silk manufactures met with great developments. Grandeur in its highest type was their study, and rich silk workmanship largely contributed to its display. Abul Fazl says: "A variety of new manufactures are established in this country; and the cloths fabricated in Persia, Europe and China have become cheap and plentiful. The skill of the manufacturers increased and the Indians gained a complete knowledge of their profession. The greatest impetus was imparted by Empress Nur Jahan who, during her residence with her first husband in the district of Burdwan, having taken a fancy for the Birbhum silk fabrics afterwards set the fashion for them at the Imperial Court, and in India a fashion lasts for several centuries. The Omrahs and other Grandees of the realm dressed themselves in rich silks. The Divans were spread with rich silk carpets. Brocaded silk cushions became the principal adornment of the rooms. The article was used in hangings, and housings, and howdahs, in banners and streamers, and in fans and parasols. Hindu gods and goddesses were decked in silk. Monsieur Bernier the celebrated French traveller describes the throne room of Shajehan as surmounted with a richly embroidered velvet canopy. The pillars of the hall were magnificently ornamented with gold tapestry and the ceiling was covered over with beautiful flowered satin, fastened with red silk cords, having at each corner festoons with gold tassels." According to Bernier the variety of scarfs, turbans and brocades made in India is incredibly large. Every description of silk goods—satin, velvet, damask, brocade, chelie, and tussar were then made by the Indian manufacturers. Their design and taste have been universally admired, and the perfection of their kmanship is yet unrivalled. In the Aini Akbari no loss

than 28 kinds of embroidered cloths and 38 kinds of silken stuffs with their current prices have been mentioned.

In Bengal, Malda probably was the centre of silk trade. Sir George Birdwood (*Indian Arts*, page 375) as also Dr. Hunter mentions that it is on record that in 1577 Shaikh Bhiku of Malda sent 3 ships of Malda silk cloth to Russia by the Persian Gulf. From the *Travels of Ludivico Divar Hema* of Italy we know that 50 ships of cotton and silken goods used to be exported annually from Malda. The East India Company used to buy large quantity of raw silk and silken goods from India from 1600-1619 (Sir George Birdwood and Mr. Foster). Cambay, Masulipatam and Surat were the Chief manufacturing places then. Bernier in his *Travels* (1656-8) says: " There is in Bengal such a quantity of cotton and silks, that the Kingdom may be called the common storehouse for those two kinds of merchandise, not of Hindusthan or the Empire of the Great Moghul only but of all the neighbouring kingdoms and even of Europe". Tanernier (*Travels in India*, 1676) tells us that in his time Kasimbazar (in Murshidabad) furnished about 22000 bales of silk annually each bale weighing 100lbs. "The Dutch", he continues, "generally took either for Japan or for Holland 6000 to 7000 bales of it and they would have liked to get more, but the merchants of Tartary and of the whole Moghul Empire opposed their doing so, for these merchants took as much as the Dutch and the balance remained with the people of the country for the manufacture of their own stuffs. All these silks are brought to the kingdom of Gujarat, and the greater part came to Ahmedabad and Surat, where they are woven into fabrics." Bernier says: "The Dutch have sometimes seven or eight hundred natives employed in their silk Factory at Kasimbazar, where in like manner, the English and other merchants employ a proportionate number. These facts go to prove that silk rearing, reeling and weaving were in a flourishing condition in India long before the advent of the Dutch and English traders. In 1700 Sir George Birdwood writes in *Industrial Arts of India*: "A law was passed by which all wrought silks, mixed stuffs, and figured calicoes, the manufacture of Persia, China and East Indies, were forbidden to be worn or otherwise used in Great Britain. It was particularly designed for the protection of the Spitalfields silk manufacture but proved of little or no avail against

the prodigious importation and tempting cheapness of Indian piece-goods at that time " For a long time Indian silk goods held their own "but once the machine-made silks took their place in the markets of the world, the doom of the hand-loom industry was so to speak, sealed and the increasing cheapness of cotton textile still further tended to depress a beautiful art and to rob it of its native stimulus without which all art inevitably tends to decay". (Indian Textile Journal, August 1900.)

In 1772 about 180,000 lbs. of wound silk was exported to England from India, in 1785, 324,307 lbs. . Foreign trade Export. in 1795, 380,352 lbs; but 20 years later Bengal supplied 736,081 lbs. (Milburn's Rise and progress of the silk trade.) In 1805 the total exports were 835,904 lbs.; in 1825 they came to 919,436 lbs.; in 1835 about 727,535 lbs.; in 1867-8 about 2,226,201 lbs. valued at Rs. 15,532,290. In 1877-78 the total exports from India were 1512,819 lbs. valued at Rs. 7,035,493; in 1887-88 about Rs. 4,808,000 worth of silk was exported to foreign countries; in 1892-93 about Rs. 6,175,000; in 1900-01 1,604,275 lbs. valued at Rs. 5,122,057; in 1908-09 about 1,833,644 lbs. valued at Rs. 5,405,077; in 1909-10 about 1,207,561 lbs. valued at Rs. 5,075,739 and in 1910-11, 1,847,401 lbs... valued at Rs. 5,055,287.

The value of the exports has in recent years been steadily decreasing. Although the quantity of silk exported has not diminished very materially the value of the export declined to a thread of what it was. In Europe the utilisation of waste silk began to be understood from the year 1857 and consequently the exports of India changed their character. The returns rapidly manifested a decline in value due largely to the increased quantity of export of waste silk and cocoons in place of the reeled silk. With the opening of new ports to foreigners raw silk began to be exported to Europe in large quantities from China and Japan and Bengal silk came into disfavour. The superior silk goods, which India produces, is consumed in the country—the quantity consumed is very much larger than that exported to foreign countries. The export of corahs and other inferior silks has been declining. On average India exports about Rs. 2,000,000 worth of silk pieces annually now; while in 1882-83 she imported £1·95 million pounds and im.

1907, 2·07 million pounds worth of silk. According to Mr. Natalis Rondst of Lyons the greatest authority of sericultural statistics India produces about 12,00,000 seers of silk and consumes about 13,20,000 seers of silk per year.

In 1876-77 the import of silk was valued at 58½ lakhs of rupees; in 1881-82 Rs. 135 lakhs; in 1900-01 Rs. 1,66,58,108; in 1904-05 Rs. 2,11,81,502; in 1907-08 Rs. 30,000,000. These show a remarkable expansion. Import. Bombay is the chief distributing centre; raw silk from China and Japan and spun silk from Europe are imported here and are carried through the presidency of Bombay to the Punjab and even to the United Provinces. The Punjab may be called the great consuming province and Bengal the great producing province. Bengal silk is carried to Nagpur, Poona, Amritsar, Madras and to other centres of weaving. It is curious that in Bombay which has to depend upon raw material, the silk manufacturing industry has taken comparatively large and active proportions, while in Bengal the very centre of Indian silk production there is only one big silk mill to be found. The Bombay mills manufacture in considerable quantity for the Burmese market which is much closer to Bengal and there is also a large market in U. P. for the out-turn of silk looms; but Bengal is content to produce in annually diminishing quantities for an unprofitable export market and confines its manufactures to a few corahs and other similar goods made by hand. Want of enterprise, originality and manufacturing skill is the root cause of the decline of the silk industry here. It is indeed melancholy to record the continued decadence of the Indian silk industry as far at any rate as the production of raw silk is concerned. The manufacture of silk keeps up pretty steadily but a considerable proportion of the raw material required for manufacture is imported from China, Japan and Europe.

It will not be out of place if we take a review of the sericultural conditions of all the provinces and states in India.

Expert opinions hold that the Bengal races of silkworms are degenerating and the industry will be doomed in a few decades if a stronger and a

Bengal.

50% of silkworms die of diseases as the rearers cannot get disease-free eggs and all the hereditary rearers of Bengal who depend entirely upon it for their livelihood are becoming bankrupt and many are leaving the profession for a better one. The Government of Bengal have established some nurseries in the districts of Murshidabad, Rajshahi and Bogra for the supply of disease-free eggs at some reasonable rate and for helping the rearers of a few model rearing villages with disinfectants and breeding appliances, have started three sericultural schools where *bona fide* rearers are admitted. The general control and management of the whole operation are vested in a committee. One French expert has been appointed to make experiments in hybridisation. The Maharaja of Kasimbazar has established some nurseries for supplying disease-free eggs. Messrs. Anderson Wright & Co. silk merchants of Bengal are doing valuable service by their experiments in Manipur and Ramnagore and selling univoltine eggs to applicants. The Maharaja of Tipperah also has been trying to introduce silk culture in his state. The above nurseries cannot produce more than Rs. 15,000 worth of eggs whereas the Bengal rearers require about 2 lakhs of rupees worth of eggs annually.

The European companies who have got silk Filatures in Bengal for reeling are winding up their concerns as there is no profit in the business and as sufficient cocoons are not available for big establishments and the Bengal system of reeling machine is being set up in large numbers in many houses.

The weaving of silk cloth which has been on the decline in recent years, is reported to be reviving in slow degrees. The Bengal silk factory is catering for the Burmah market; small factories with three or four looms are being started for silk weaving. The chief drawback is the want of proper organization:—No uniform plan exists for the disposal of silk fabrics in the different districts; individual weavers going to money-lenders or shopkeepers, carrying their goods in their own hands for sale is the general rule: occasionally one rich weaver succeeds in securing cloths from a number of weavers; middlemen practically fix their own price and leave the weavers only a living wage; some weavers either hand over the cloth to the money-lender who advanced them the cost of the thread or others sell on their own

Assam is the home of Eri and Mooga silk. In 1889-90 she exported about 1300 mds. of Eri silk but

Assam.

at present the industry is stationary or on the decline. The hill tribes generally rear small number of worms with the castor leaves from their homestead lands and then spin and weave them. The possibilities of eri silk are great; the Pusa Research Institute has taken it up and is advocating it as a cottage industry. A small quantity of mulberry silk is also produced in Assam. Experiments with univoltine eggs proved successful in the Shillong Fruit Garden and Khasi hills. Messrs. Anderson Wright and Co. are trying some experiments with univoltine silkworms in a place near Manipur. All the submontane regions are suitable for univoltine mulberry silkworm rearing.

Behar is the chief distributing centre of Tussar fabrics which take a very important place among

Behar.

the manufactures of the district of Bhagalpore. Cocoons are collected in the jungles of Singhbhum, Manbhum, Bhagalpore, Sonthal Perganas and Moubhanj etc. and taken to Bengal for reeling, spinning and weaving. Bafta and Tussar cloths are carried to different parts of India and Europe from here. The industry is perhaps not in such a flourishing condition as it was a few years ago; but still it is of considerable importance; about 2000 weavers earn their livelihood by the manufacture of Tassarcloth alone in the district of Bhagalpore. The Tussar Farm at Chaibassa was started on the lines laid down by late N. G. Mukherjee for distribution of good eggs to the rearer by the Govt. but has been stopped recently. The Agricultural College of Sabour has started eri silkworm rearing. In the Imperial Agricultural College of Pusa training in eri and mulberry silkworm rearing, spinning, reeling, dyeing and weaving is given to students who come from different provinces of India. Univoltine acclimatised mulberry silkworm eggs, eri eggs, mulberry seed, castor seed and instructions through correspondence are given free to any applicant. Experiments on crossbreeding are carried on. Eri silk as a cottage industry has been shown to be quite suitable in India. Some indigo planters have taken to rearing and weaving eri silk and many have commenced rearing eri silkworms.

in November and February. Like the Madras school of Arts and Industries which has done much to promote the growth of an important industry (the aluminium) the Institute is trying to revive an indigenous industry which is slowly and silently dyeing away.

Mirzapur is the chief Tussar weaving centre ; Benares and Agra are the silk weaving centres—the

The United Provinces.

former being the manufacturing centre of the brocade industry ; it has from ancient times been noted for the excellence and purity of its silk fabrics, the chaste designs have elicited admiration even from those who have seen the work of Kashmir weavers. Slow outturn of cloth is the greatest defect of the weavers ; it is expected that if they adopt improved looms they would be able to quadruple their outturn ; they are turning out many new designs, patterns and colours. There are some factories which employ 15 to 30 weavers in the heart of Benares city. Some weavers work for themselves but many take advances of silk or money from the money-lender or Mahajan who buys from him the finished product at a very low rate. The Benares Co-operative Society for weavers is now helping the silk weavers good deal. Like the weavers of other sister provinces the weavers here are handicapped by want of capital and lack of technical knowledge. They live a hand to mouth existence and cannot even think of improving their loom by which the outturn may be increased though the Government have set up nine weaving schools in four of which silk weaving is taught. The Salvation Army is also spreading the art of silkworm rearing and weaving in Moradabad and Ludhiana. The Government are encouraging the introduction of Eri silk as a cottage industry and with that object in view one factory has been established in Shajehanpore. For the distribution of eri eggs and for spinning and weaving. Messrs. Lister & Co. in the Dun and Maharaja Rampal Singh in Partabgarh carried on experiments with mulberry silkworms which proved to be abortive. Similar experiments were undertaken by the Government but none met with adequate success.

The Punjab imports about 15 to 20 lakhs of Rupees worth of raw silk from Bokhara, Kashmir, Afganistan, Bengal and Karachi. The district reports tell us that she is importing gradually diminishing quanti-

Punjab,

ties of raw silk as the silk manufacturers cannot compete with the cheap goods of Europe. The dyers and weavers of Umballa, Jhang, Montgomery, Dera Ghazi Khan and Gujranwala were in flourishing condition during the Sikh time but now they are handicapped by want of capital and lack of technical knowledge like their compatriots elsewhere. Lister & Co. and the Forest Department tried to introduce univoltine silkworms. At present the Director of Agriculture is buying univoltine eggs from France and is wintering them in Simla for distributing them to the rearers in spring and is encouraging the industry by giving medals, prizes and in every possible way. The Irrigation Department is planting mulberry trees along the canals for the benefit of the people; the Agricultural College at Lyallpur is advising people regarding scientific rearing; it is expected that in the sub-montane regions of the Punjab silkworm rearing will be commercially successful. About 10,000 people live by the industry here.

Bombay is the chief importing centre of raw silk and spun silk from China, Japan and Europe. The
 Bombay Presidency, weaving mills cater for Burmah market. The spinning mills of Bombay supply the Punjab, United Provinces and Bengal with spun silk. In Shikarpur (Sindh) silk dyeing is done in considerable quantities. Yeola, Ahmedabad, Poona, Solapur, Surat, Thana, Belgaum, Dharwar, Bijapur, Nasik, Ahmednagar are weaving centres. The Agricultural Department is trying experiments in eri silkworm in Poona and Dharwar. Three nurseries have been established in the Baroda State for mulberry silkworm rearing: the state is also encouraging the rearing of silkworms. Experiments to introduce silkworm rearing were carried on in Khandesh, Poona, Ahmednagar, Dharwar but did not meet with success.

The industry is gradually declining in the Presidency. The
 Madras Presidency, weavers attribute this to the competition of cheaper machine-woven goods from Europe and of the "cheaper fabrics dyed in gaudy and fugitive colours with artificial dyes". Raw silk is principally imported from Bengal, Mysore and Bombay; raw silk is exported in a very limited scale but waste silk is exported to Great Britain and France to a consider-

able extent. The export of piece goods to Burmah is fitful and oscillating. Silk weaving is done in Tanjore, Trichinopoly, Chidambaram, North Arcot district, Madras, Conjevaram and Bellary districts. In some districts cotton cloths with silk borders are woven. Tussar cocoons are found in the jungles of Ganjam, Vizagapatam and Chinglepat. The Government tried to introduce silkworm rearing in Sydapet, Coimbatore, Rajmahendry, Vizagapatam and Chinglepat which however proved to be failures. The results seem to show that it is possible to rear silkworm during the colder months. Everything has been left now to private enterprise. The late Mr. Tata tried to revive the silk industry of Mysore which possesses an ideal climate for all kinds of silkworms and with that object in view established a farm and a sericultural school in Bangalore which have now been taken up by the Salvation Army who are being helped by the Mysore State. The Agricultural Department is trying experiments in Eri and Mulberry silkworms in Coimbatore. Travancore State has also started one Silk Farm in Trivendrum. It is expected that the industry will be re-established in the genial climate of Southern India. Mysore produces about 12 lakhs of rupees worth of silk annually.

The Tussar silk industry is declining everywhere. India exports about 200,000 lbs. of Tussar cocoons annually nearly half of which is being exported from Central Provinces. Two Tussar silkworm nurseries have been established in Arsoda and Chanda on the lines laid down by N. G. Mukherjee for the distribution of good seeds to rearers. There are about 3,000 Tussar workers in the Central Provinces. The weavers and spinners make superior fabrics. Some Tussar cocoons are sold to merchants from Bengal, where they are spun and woven. The weavers import mulberry raw silk from Bengal. Experiments on Eri silkworm rearing are being carried on in Nagpur, Chanda, Arsoda, Bhopal State, Ajmere, Gwalior and Indore States. Indore and Gwalior States are keen on introducing mulberry silkworm rearing as well. Mulberry trees grow naturally in some parts of the country and it is quite possible to rear mulberry silkworms in colder months.

The Yabein tribe of Burmah rears mulberry silkworms and produces cocoons for local consumption.

Burmah.

Burmah imports large quantity of silk from Calcutta, Bombay, Madras, China and Japan. The Director of Agriculture is carrying on experiments to rear Eri silkworms in Mandalay.

The Salvation Army have taken up the Farm at Peradeniya where they are rearing mulberry and Eri

Ceylon.

silkworms. A gentleman in Galb tried to introduce univoltine silkworms but he could not succeed.

Experiments were carried on in Khelat by the Government for some years but the work has been stopped temporarily as mulberry leaves are not available.

Beluchisthan,

The Maharaja of Kashmir is highly to be congratulated on the rapid expansion of the silk industry and

Kashmir and Jammu.

its sure promise of being a permanent one.

The State has reserved the monopoly of buying cocoons and has started reeling and weaving factories. It buys univoltine eggs from France and distributes them among the people who are allowed to pluck leaves from State mulberry trees to feed the worms but they can only sell the cocoons to the State officials who deduct the price of eggs and other materials advanced to the people at the time of buying cocoons. The State sericultural overseers go from house to house and advise them regarding up-to-date rearing, planting and pruning mulberry trees etc. Prizes are awarded, advances and all possible encouragements are given to successful rearers.

Science has done more to improve sericulture than probably any other agricultural industry. The scientific investigation of Pasteur, Bassi and other savants saved the decaying industry of Southern Europe from ruin. In this connection we can study with great profit the record of the development of sericulture in European countries. In 1840 in France the average quantity of cocoons obtained from one ounce of eggs

France.

was 35 to 40 lbs. but now by the sustained Government action it is over 80 lbs. and it increases every year ;

whereas in India the present yield of cocoons per ounce of eggs is about 50 lbs. and this quantity is gradually decreasing.

There are more than 59 sericultural observatories and laboratories now working in the Kingdom of Italy
Italy. under the direction and dependence of the station at Padua. Itinerant sericultural experts go from house to house and explain the rearers the up-to-date scientific method of rearing and advise them in various ways. These have given a mighty impulse to the revival of the silk industry. About 200,000 people find their living or additional means of living from silk.

In Hungary the Government supply the rearers with eggs, mulberry trees and seeds, and buy the cocoons from the producers for two-thirds of the market value. The Government have forbidden the sale of eggs, have erected the Institute of Egg Supply and Microscope section of Szegszard which to-day possesses 160 microscopes and examines about 1027 Kilos of eggs; have located an employee in each breeding commune to distribute eggs and educate the rearers; 20 to 25 of these communes are now under the charge of a District Inspector 82 of whom are now grouped in eight sections. At the head of each section is a Chief Inspector with an Assistant Inspector who sees to the proper discharge of their duties. By means of officials the Government supervise 5363 commercial Agrarian schools which are obliged to set apart two-thirds of their land for the cultivation of the mulberry. The Government further maintain 145 special schools for growing mulberry trees.

The present Government have turned their serious attention to this industry and have passed a special
Bulgaria. law for its encouragement. Concessions of monopoly of given areas are granted to intending builders of filatures, free sites are offered, all rates and taxes are remitted and a 2 Fr. bonus is to be paid by the Government for every 2 lbs. of raw silk exported for a period of 5 years from the date of the first consignment.

There are about 125 schools in the Kingdom to teach sericulture in some of which sericultural experiments and researches are conducted. Subsidies are granted to rearers and mulberry growers, *circuit* lecturers are employed to spread the scientific knowledge, competitive exhibitions are held, laws have been enacted for the examination of the silkworm eggs. There are about 132 offices for the examination of disease-free eggs. In Yokohama the silk conditioning house which examines all raw silk to be exported, and reports on the qualities to the buyers and sellers, has been established; about 137 Guilds, 4 Associations and 2442 Sericultural Co-operative Societies have been started for the improvement of the industry.

Even in England and America where there is no Sericulture, Silk Associations have been established to safeguard the interests of the dyers, weavers and silk manufacturers.

Some Suggestions
Sericulture as a rule should be carried on by the farmer as a by-industry and one of the rooms of his dwelling being employed as the rearing room while the female members of his own family attend the worms; it has seldom succeeded when conducted on a large scale. In a country like India where the females generally observe the *Purdah* and where the standard of living is cheap, the industry is extremely suitable; the margin of profit in this industry being small the people of Europe cannot take to it earnestly.

The motto of every rearer should be the best of everything,—best mulberry trees and leaves, best eggs, best worms, best cocoons, best silk. To make the enterprise a success the people must take to it in a businesslike way; they must attend to quality and not to quantity. A woman with her daughter or son can feed the worms produced from an ounce of eggs which if properly looked after, will yield a maund of green cocoons worth about Rs. 25 in about 30 days which will be quite sufficient to keep them for 3 or 4 months.

The potentiality of India for this industry is great,—greater indeed than many can imagine. Silkworms thrive best in a

temperature of 70° - 80° F; there is scarcely place in India where this temperature cannot be obtained. In one district this may be easily secured in October, in another in January, while in a third in March but it is very essential that the proper season should be chosen for each district for rearing the worms, an operation which requires expert knowledge. In a new locality sericulture cannot be established in a day; to establish it on a firm footing one must persevere for at least 8 or 10 years.

The silk trade of America, Germany and Great Britain, where silk fabrics only are manufactured but where they cannot produce raw material, cannot be said to be established on a firm basis; the moment the importation of raw material is stopped all their manufacturing skill is undone. Everywhere trade has been decentralized; for many years France has had the monopoly of silk trade. Spinning, home weaving, dyeing developed to a great extent and in 1870 the home supplies of raw silk became insufficient which was imported from Japan, Asia Minor, Italy and the Caucasus to the amount of £10,000,000 but by and by new centres of silk trade grew up at Basel and Zurich, Stavropol in the Caucasus and Crefeld, Italy, Austria, United States and Japan. And what is the result? France to-day imports no less than one-third of the silk fabrics for her home consumption though she exports a large amount of good silk stuffs. The prominent features of the times we live in are that industries of all kinds decentralise and are scattered all over the globe. Belgium and Great Britain have no longer the monopoly of the woollen trade, Germany today exports ten times more woollens than Belgium, Riga and Moscow supply Russia with woollen goods. England is losing ground in her cotton fabrics; while Germany, United States, India and Russia are gaining. Each nation becomes in its turn a manufacturing nation and the time is not far off when even backward India will manufacture nearly everything she is in need of. The first steps of every new enterprise are difficult and seem to be discouraging. Circumstances and accidental causes may check the scattering of industries for sometime but when once any industry has taken firm root it calls into being hundreds of other trades and as soon as the first steps have been made and the first obstacles have been overcome the industrial development goes on at a rapid rate.

Some practical suggestions are now being made:—

1. Distribution of disease-free eggs to the rearers; only licensed rearers should be allowed to sell eggs after microscopical examination. The Government must have examination offices in all the big centres of rearing where the Government officers should examine eggs free of charge or they may go from house to house examining the eggs.
2. Encouraging the rearers to rear one-brooded race in October and February and Mysore or some well-established many-brooded hybrid races in other seasons. In order to induce the rearers the eggs must be distributed free at first.
3. In a new locality where there is no sericulture castor silk-worm eggs should be first introduced as this race is more hardy.
4. The appointment of circuit lecturers who have expert knowledge of sericulture for advising the people.
5. The holding of competitive sericultural exhibitions in important centres.
6. The sanction of subsidies for sericultural classes in village schools, mulberry trees, cocoons, reeled thread, etc.
7. Free distribution of pamphlets in the vernacular of the district for the guidance of rearers.
8. The starting of Silk Associations whose object should be:—
 (a) to safeguard the interests of silk manufacturers, (b) to reply to queries regarding silk industry in general, (c) to send members to various exhibitions, (d) to bring together spinners, weavers and traders, (e) to collect and disseminate useful information and statistics regarding silk, (f) to promote technical and commercial knowledge by starting schools for rearing, weaving and dyeing in important silk centres like Bhagalpore, Berhampore, Benares, Ahmedabad, Malda, Gurudaspur, Nagpur, Madras, Bangalore, etc., (g) to induce the manufacturers and retail traders to demonstrate to the people who are carried away by gaudy colours that Indian

of view of price and durability, (*h*) to secure just and equable relations between the silk merchants and the rearers, (*i*) to expand the growth of industrial art, (*j*) to establish Libraries and museums on sericulture in silk centres, (*k*) to induce Government to take up sericulture in Khas Mahals as Model Zamindar and in Court of Wards estates thus setting examples to others, (*l*) to impress on manufacturers the advantages of Indian as compared with other silks and to be particular about the quality of the silk exported until a silk conditioning house is established in Calcutta or Bombay by the Government which would stop the exportation of bad silk, (*m*) to establish co-operative societies and guilds among silk-growers and manufacturers.

9. The establishment of a central sericultural institute with branches in all the important places of silk rearing.

The Study of Economics in India.

BY

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There is a traditional way of speaking about Indian thought and the Indian mind as if they had never really been at home except in the rarefied atmosphere of metaphysics and abstract philosophy, and had never shown either aptitude for, or real interest in, the study of anything so gross and palpable as the wealth of nations or the conditions of material well-being. This is a one-sided view which is by no means borne out by a study of Indian literature. In the Sanskrit writings which best reflect the culture and civilization of ancient India, material interests and the material side of life are not ignored or neglected; and there are grounds for stating that in this very city of Patna or—to give it its old name 'Pataliputra'—the study of Economics was recognized more than twenty centuries ago as one of the indispensable branches of a liberal education. According to that amazingly instructive work the Arthashastra of Chanakya, the science known as Vārtā, of which agriculture cattle-breeding and trade were the main divisions, took rank as one of the four principal sciences; and students invested with the sacred thread were directed to study it under Government superintendents who were specialists in the subject.

I do not propose to treat my subject to-day from an antiquarian standpoint, or make any attempt to trace the development of economic studies in India from the time of King Chandra Gupta to the reign of King George. We are concerned here not with the learning of the remote past, but with problems of the present and immediate future. But it is of some interest to note at the outset that the growth of interest in economic subjects which is so remarkable a feature in

India of to-day, is not a wholly new or unheard-of phenomenon in this country, or one that ought to be regarded as in any sense alien to the natural tendencies of the Indian mind.

It is obvious enough however, that the actual economic conditions of to-day, (in India as in the rest of the world), and also the scope and character of modern economic theory, are widely different from anything with which Chanakya and his contemporaries were acquainted. Within the last hundred years (to go no further back) both the subject of study and the scientific standpoint from which it is treated have been radically transformed ; and at the present moment the process of transformation appears to be proceeding with undiminished—or perhaps even increasing—rapidity. The conception of India as passing through a stage of economic transition has been made familiar to us by writers like the late Mr. Justice Ranade and Sir Theodore Morison ; and this process, even though we may not take precisely the same view, or attach quite the same importance to it as either of these authorities, must be accepted as an outstanding fact. And it is a fact which gives to the study of Economics in this country a special interest, and at the same time makes it specially difficult.

I. DIFFICULTIES TO BE FACED.

That Economics in many aspects (and specially in those which bear most closely upon practice) is a difficult study must be admitted ; and it must also be admitted that there are peculiar difficulties in the application of current economic theories to Indian conditions. Both the difficulty and the importance of the study should make us very cautious how we handle it. There is no science which offers fairer promises of practical utility ; but there is also perhaps none which contains more dangerous pitfalls for the hasty or the unwary. In the name of political economy a deplorable amount of non-sense has sometimes been talked. In that admirable compendium of pedagogic wisdom the “ Hitopadesa”, there is a sloka in which

“twig-gathering knowledge” (pallavagrāhi pândityam) is described as one of the three great curses of human existence. And there is probably no important branch of study in which knowledge of this sort (knowledge *i. e.*, which consists in a superficial smattering and has neither root nor stem) is either more easily come by, or more fatal in its capacity to stultify and mislead.

This perhaps sounds as if it might lead up to a solemn warning that so perilous a science should be left severely alone; but this is very far from the conclusion that I wish to draw. The fact that a little knowledge of economics may be a dangerous thing does not justify the inference that complete ignorance of it is a safe and desirable condition of mind. The inference rather is that it should be studied seriously and with such thoroughness as our faculties permit; and that we should recognize at the outset that the subject is a difficult and not a simple one. The obscurity and complexity of the subject and the delusions regarding it which arise from imperfect knowledge and shallow reasoning are the strongest possible reasons for giving not less but more application and intelligence to its study.

There are certain sources of error common to this and other cognate branches of knowledge which may be classified broadly under two main heads:—(1) the inherent complexity of the facts, and (2) the subjection of the human mind to bias and prepossessions in connection with them.

(1) *Complexity of Facts* :—

There is something almost inconceivable in the multiplicity of the various conditions and processes which in a modern community enter into and affect the production and consumption of wealth. Take, *e. g.*, a single individual, belonging to any class whatever—from raja to rayat, or from millionaire to crossing-sweeper; and consider his economic activities—his actions as a getter and spender of wealth—during a single month of his life. Try to estimate all the various causes which determine

what he earns or receives, and how he spends it. You will find yourself embarked on an inconceivably wide and various, and apparently quite endless course of enquiry. He is, to begin with, an individual person, possessed of a character and of capabilities which are partly the common possession of the class or social group to which he belongs. To give a complete account from an economic standpoint of all that he does, and the reasons why he does it, would involve not only a history of his own life education and opportunities, with researches into his parentage and ancestry, but also an exhaustive analysis of the customs and organization of the society of which he is a member. Then again there is a multitude of circumstances external to, and at first sight vastly remote from, the man himself, which may yet in subtle and far-reaching ways affect his position and outlook in the economic world. Suppose, *e. g.*, that he is either a buyer or seller of agricultural produce in Behar. The amount which he has to give or is able to obtain in exchange for it may be affected by climatic conditions in distant parts of India, or even possibly in Russia or America. Similarly the price which he has to pay for the necessaries of life, such as cotton cloth, or kerosene oil, may be influenced by a party crisis in England or a change in the law affecting business corporations in the United States. At whatever point we try to take hold of the economic situation, we find ourselves dealing with the same complex entanglement of shifting and interacting forces. To start with a few simple propositions, in order to arrive by simple and easy chains of reasoning at plausible and easily understood conclusions, and to accept such conclusions as true without further test or verification, is a progress obviously inapplicable to this kind of subject-matter.

Considerations of this nature have sometimes led to a summary rejection of the methods and doctrines associated with the "old", or "orthodox" school of economists. Such an attitude to my mind is based on a seriously mistaken view of the nature and value of their work. That is a point to which I shall return shortly. At present I merely wish to illustrate the common fallacy which consists in falsely simplifying a

concrete problem by neglecting relevant conditions, and assuming a uniformity and absence of complicating circumstances which never in fact exists. So far as the older economists really did treat concrete problems in this way, they fell into one variety of the general type of erroneous reasoning which I am considering. But it is necessary to observe that there are other varieties of the same type of error, from which the arguments of their critics themselves have not always been free. Reasoning of an unduly narrow and abstract theoretical character is one way of evading difficulties; loose and vague reasoning of a "historical" kind is another way that is even more likely to mislead. Argument of the latter sort is often just as "abstract" as the former, in that it takes account only of some small fragment of relevant conditions and antecedents; while it gains less than nothing from the fact that it is not so severely logical, and rests upon assumptions which it is less easy to detach and examine. Because it can be shown that a short cut in one direction does not lead to economic truth, it does not follow that a shortcut in the opposite direction does. Yet one sometimes comes across arguments of a popular nature, in favour, *e. g.*, of protective import duties, or other forms of state encouragement of industries, which are rather of this type. The theory of *Laissez Faire*, it is said, is exploded; the abstract reasonings upon which it was based have broken down; and the principle of free and unrestricted competition, with as few impediments to exchange as possible, can no longer be upheld as a universally valid idea. All this may be true enough; but from such negative premises only negative conclusions can be drawn. With regard to any particular proposal for restricting trade, it can fairly be argued that it is not to be condemned at sight out of deference to the said exploded theory. The question of its expediency is in fact an open one, to be argued out with reference to a given time and place, and to all the conditions which happen to be relevant. But the line of argument actually adopted is often one which proceeds practically direct from a denial of the truth of the *Laissez Faire* doctrine as a univer-

sally valid theory to the affirmation of the expediency, in some particular time and country, either of a general policy of protection or of certain special restrictions in favour of particular branches of industry. The conclusion may or may not be true ; but it certainly is not proved to be so by an argument of that type.

(2) *Liability to Bias.*

The hasty reasoner of the "historical" or "national" school is no less open to the charge of ignoring the complexity of facts than the abstract doctrinaire thinker of the older type. But in another respect his reasonings are even more liable to error. They are more apt to be coloured and perverted by the prepossessions and real or imagined interests of the individual reasoner. (2) This brings me to the second of the sources of error of which I spoke. It is evident that if we are to have a reasonable chance of reaching true conclusions regarding economic problems, we ought to study those problems with a single eye to the truth, and should approach them in a disinterested and severely scientific spirit. That is easily seen, and easily said ; but it is a counsel which it is peculiarly difficult to act upon with steady consistency.

In the first place the chief motive which attracts most of us to the study is not a purely intellectual thirst for knowledge. It is an interest of a warmer and more human kind in conditions which are accountable for the happiness or misery of large masses of our fellow-beings, and in the forces which promote or defeat human progress. We cannot be detached or indifferent spectators of these conditions and forces. We see two competing sets of interests in opposition ; and our sympathies are with the one and against the other. There are some conclusions which we desire ardently to see established ; there are others which we should regard with aversion and dislike. We are apt to set ourselves to establish the former and refute the latter ; and incidentally to manufacture theories whose hold on our belief is determined by the interest which we have in believing them,

and may be wholly disproportionate to the strength of their foundations in logic and experience.

It has to be recognized too that in the actual world economic questions cannot be wholly isolated, or enclosed in a ring-fence which will exclude every consideration of a non-economic character. As soon as we ask for the full explanation of an economic fact, or try to follow out in practice lessons drawn from some economic principle, we are forced to realize that there is a host of facts and principles of other kinds which refuse to be left out of account. Economic questions constantly turn out to be inseparably bound up with questions of an ethical, social, political or even religious character. And these other considerations not only complicate the matter hugely when it comes to a question of facts or of practical issues; they sometimes make it appear unnatural or inhuman to adopt the strictly neutral attitude of the scientific enquirer. When we endeavour to reason correctly in such cases we are apt to find ourselves in as difficult and ambiguous a position as that of the judicial officer who made it his aim "never to swerve either to partiality on the one side, or to impartiality on the other".

The more determined we are to avoid the errors of abstract reasoning, and to study our subject in the concrete and in a practical spirit, the more difficult it becomes for us to escape the influence of various kinds of bias and interest. If we abjure the region of abstract principles and decide to admit every kind of relevant consideration, we merely pass from Scylla to Charybdis. Our reasoning in losing its narrowness is prone to lose also all its logical coherence and certainty. It no longer has any fixed starting point, clear limits or definite guiding principle. Such guidance as is forthcoming is almost inevitably the guidance of inclination or prejudice. There may possibly be a gain in the colour and picturesqueness and facility of our studies; but there is almost certain to be a loss in rational sequence and in the logical validity of our inferences.

That bias and prejudices of many kinds are a preponderant influence in the formation of popular opinion on economic matters, is perhaps too obvious to be questioned. That the bias is in many cases creditable to the heart and character of those who are misguided by it, may be an extenuating circumstance, but is hardly a relevant defence. Strong sentiments or interests are almost equally likely to mislead, whatever may be their moral quality. The dominant bias may be selfish in one man's mind, patriotic in another's, and humanitarian in that of a third ; and all three may be equally incompatible with clear or scientific thinking.

II. METHODS OF STUDY.

In the complexity of the subject-matter, and the liability of the mind to bias in regard to it, we thus have two great standing difficulties by which the study of Economics must always be in greater or less degree obstructed. They are impediments whose obstructive influence may be minimized, but can hardly be evaded altogether ; and the first step which is necessary in order to minimize it is to recognize fully and clearly the fact of their existence. The next is to devise a course and methods of study which may enable the mind to surmount them as far as possible.

I need hardly discuss here the preliminary training and mental equipment that are required. Not much is needed in the way of preliminary knowledge beyond a moderately extensive acquaintance with history and geography, and the course of current affairs ; the only indispensable intellectual qualification is a habit (unfortunately somewhat rare) of thoroughly assimilating all knowledge that enters the mind. The opposite habit (unhappily too common) of mechanically repeating phrases and formulas with the minimum of attention to their significance, is a disqualification which is often enough to render all study a sheer futility.

(3) *Classical and Historical School.*

Taking for granted, then, the necessary minimum of general knowledge and trained reasoning power, I want now to consider what is the best method of overcoming the difficulties of economic study, and obtaining the highest advantages from it. In order to decide this, it is necessary to return for a moment to the well-worn topic of the controversy between the so-called Classical and the Historical School. Are we to employ both or only one of the two rival types of reasoning? There is the abstract deductive method on the one side, and the concrete inductive method on the other. We have seen that each has its own shortcomings; but their rival claims require a closer examination. If we are to employ both methods, how is our labour to be divided between them? And how are the diverse results to which they may lead us to be brought together and harmonized, and fitted into a coherent scheme of knowledge?

These are questions which have to be studied not in an abstract and general way, but with reference to the peculiar economic conditions and circumstances of this country. To answer them with any fulness is quite beyond the scope of a paper like this; and I shall not attempt to do more than indicate in a brief and cursory manner some of the main considerations which have a bearing on them.

There is one point at least which may be decided off-hand. It may be taken for granted that the abstract method is not the only one that should be employed. Our study must at least in part be of a historical and inductive character. I do not know whether this has ever been disputed. It is certainly not a matter of dispute at the present day. Whether the abstract method should be employed at all, and not discarded as obsolete and valueless, is matter on which there is slightly more room for doubt. There are two sets of arguments which may be brought forward to discredit it.

(1) General Objections to Deductive Method.

There is first of all the general argument to which I have already referred that no chain of abstract reasoning can possibly be adequate to the variety and complexity of economic facts. The study of the conditions under which wealth is produced and consumed should, it may be said, be a study of actual fact ; and where the actual facts are so complicated, so subject to change, and so various in their concrete character, no set of abstract propositions deduced from a few simple principles can possibly furnish a sufficient account of them. In order to get at the truth we must recognize that man is a complex and not a simple creature, and that men are not all alike, but widely different in character, habits and motives ; and instead of starting like the old economists with assumptions which contradict this, and imply a simplicity and uniformity which nowhere exists, we should begin with a patient examination of the actual facts in all their complexity. A course of study following these lines is essentially historical and inductive. As such it has the advantage of dealing with men as they are actually found to exist, instead of with a purely imaginary race of beings, of the type represented by " the Economic Man ".

If this argument is merely directed to the conclusion that the deductive method is not the only method of economic study, it may be accepted at once. As a plea for the study of economic history, or for a recognition of the vital connection which must always exist between the economic and other aspects of social life, it is wholly sound. But as an attempt to establish the more trenchant and extreme conclusion that there is no place at all for deduction as abstract reasoning, and that the historical is the sole valid method, it is altogether fallacious.

The obvious reply is that the very consideration put forward as an objection to the abstract study of economics (*viz.* the extreme complexity of the subject-matter) is precisely the reason which makes such an abstract study necessary and inevitable. If economics were to be treated as a wholly concrete

study (*i. e.* if all the facts relevant to every economic question were to be taken into account) it would be wholly and patently unmanageable. Economic problems would have neither beginning nor end, and would spread themselves out over the whole field of human knowledge. But the moment we give up the attempt to consider all the facts, we are committed to a process of abstraction ; and the length to which we carry this process becomes a matter to be determined by considerations of practicability and convenience. By abstracting and simplifying we may appear to be losing touch with the actual world ; but it is only through abstraction and simplification that a scientific study of the actual world is possible. In adopting this course we are merely following the same course as other sciences. It is as great a mistake to condemn the abstract study of economics because the Economic Man does not exist, as it would be to condemn, *e. g.*, the study of plane geometry on the ground that there are no triangles in nature.

The economist invents an abstract and simplified form of human nature for the same reason that the geometrician invents an abstract and simplified space. He wishes to study human nature in a certain aspect ; and in order to do so proceeds to isolate this particular aspect from all others. In this aspect he finds that among the numberless causes which affect and determine human action there are certain motives (such as self-interest) and certain limiting conditions (such as the law of diminishing returns from land), which are plainly of wide and general importance. By a further abstraction he isolates these motives and conditions ; and by assuming or postulating that these and no others are in operation he is enabled to reach conclusions which may have at any rate a hypothetical and provisional truth, even though they may not be directly applicable to the actual world. If he reasons correctly, they will be true on the hypothesis from which he starts ; but their practical value will depend on the degree in which this hypothesis agrees or is at variance, with actual facts. He assumes that men always sell at the highest, and buy at the lowest, price that can

be obtained ; and on this assumption he is able to draw inferences regarding the causes which determine prices and trade-movements. Such inferences will be true in regard to any actual market just so far as the initial assumption is realized.

(2) *Special Objections in case of India.*

At this point will naturally be raised the second set of objections which have to be considered. It may be contended that in regard to India the initial assumptions of the abstract economist are so far from being realized that for all practical purposes they may be dismissed as wholly irrelevant and worthless. And an appeal on this point may be made to very high authorities, both as regards the inherent limitations of the abstract type of economic doctrine, and its special inapplicability in the case of India. Thus it has been maintained by Walter Bagehot that the science of Political Economy as treated by the older English economists is only applicable to communities of a fully developed economic type. The causes which it recognizes as affecting wealth are the main and principal cause only "in a single kind of society—a society of grown-up competitive commerce, such as we have in England". "It is only in such societies that the other and counteracting forces can be set together under the minor head of 'friction'; "and" the greatest confusion arises if you try to fit on *uneconomic* societies the theories only true of, and proved as to, economic ones". India is certainly not as a whole a country of grown-up competitive commerce. Its industrial organization is still for the most part of a primitive type ; and we are often told that it is a country in which competition is almost non-existent and 'custom reigns supreme'. And we are further confronted with Mr. Ranade's contention in his well-known essay on "Indian Political Economy" that the assumptions of the older economists are in India "chiefly conspicuous by their absence". "With us an average individual man is to a large extent the very antipodes of the Economical Man. The Family and the Caste are more powerful than the Individual in determining his position in life. . . . There is neither the desire nor the aptitude for free and unlimited

competition, except within certain predetermined grooves or groups. Custom and State Regulation are far more powerful than Competition, and Status more decisive in its influence than Contract. Neither Capital nor Labour is mobile and enterprising and intelligent enough to shift from place to place. Wages and Profits are fixed and not elastic and responsive to change of circumstance. . . . In a Society so constituted the tendencies assumed as axiomatic are not only inoperative, but are actually deflected from their proper direction."

It would be idle to deny that considerations of this nature derive great weight from reason and experience as well as from authority. Does it follow from them that the older economic theories are wholly inapplicable to India, and that it is mere waste of time and labour for Indian students to master them in the hope of throwing any light upon the special economic problems of their own country? My own opinion is emphatically opposed to any inference of this kind; and I believe that if Mr. Ranade were now alive he would recognize that a two-fold change has brought about a much closer relation than existed in his time between economic theory as developed in Europe and the actual economic conditions which exist in India. The older type of theory has been developed by its later adherents into something more flexible and less dogmatic; and at the same time new conditions have begun to modernize India, and to soften down the old contrasts between East and West.

Possible Methods for India.

Looking at the question as a practical one regarding the lines along which economic study ought to be guided in India, it is clear that there are only three possible courses.

(1) We may assume that the case of India is so anomalous that none of the ordinary postulates are sufficiently applicable to be of any value; and we may consequently decide to confine ourselves to methods of a rigorously inductive character. We must content ourselves in this case with the

task of accumulating and classifying facts, and cautiously framing such general theories as these facts may suggest or authorize. All that we can do in fact is to gather materials for a special or "national" science of economics as applied to India, which the Indian economists of the future may be expected to construct. I believe that in many departments of our study this view is correct; and it is probably on these lines that there is at present most scope for profitable investigations. But I am far from admitting that there is no fruitful work to be done on other lines: or even that work of this kind would not be better done by students who are conversant with methods and results of a different type.

(2) It may be acknowledged that in India no less than in Europe some means of simplifying our problems must be found, if we aim at finding any general clue to their complexities and arriving at anything like a clear and coherent system of knowledge. But it may be held that the principles or postulates employed for this purpose should be indigenous and not imported. They should be evolved from a general consideration of Indian and not European conditions. This is as much as to say that while one type of economic theory holds good in the West, another and broadly different type is required for the East. It is a large and bold proposition; but it can hardly be accepted off-hand. It can hardly in fact be entertained as credible until at least some plausible sketch is offered showing the character and rough outlines of the suggested system, and indicating some at any rate of the new principles and postulates which it is proposed to employ. So far as I know, however, no such suggestions have ever been put forward and the conception of wholly new and specially Indian (or specially Oriental) branch of economic theory cannot be accepted as an ideal which there is any ground to suspect of being realizable.

(3) The third course left open to us is to avail ourselves so far as we may of the general theories of European economists after testing carefully their applicability to Indian conditions. It

is no longer possible for any one to imagine that economic theory forms a compact body of doctrine, which is true everywhere and at all times. But the range and degree of its validity in regard to any particular time or place is at any rate a matter open to enquiry ; and a dogmatic denial of its relevance to India is no more justified than dogmatic affirmation.

It is evident that the questions raised are too many and various to be disposed of in any wholesale fashion. Economic theory has many branches and departments ; and Indian commerce and industries are of extraordinarily diverse types. The bearing of European theory upon different types of Indian practice offers not one but a multitude of problems ; and between many of them there is so little obvious or direct connection that each (provisionally at any rate) has to be treated separately in the light of its own special conditions. Thus in regard *e. g.* to the Calcutta money market or the transactions of a great exporting firm, the ordinary assumptions of abstract economics may be taken as very nearly correct, but in considering the grain market of an Indian village, there are so many allowances to be made, and so many qualifying circumstances to be taken into account that they appear to have comparatively little relevance, and if applied incautiously may lead to wholly mistaken inferences. It may be said, perhaps, that the few big commercial centres which exist in India are really imported fragments of Europe, and as such are a mere anomaly in India, and not an organic part of the properly Indian economic system. There is some truth in this ; but it is easily overstated. The highly organized system of commerce and manufactures which has established itself in these centres is doubtless exotic and not an indigenous phenomenon. But many of the forces which make modern India what it is, and more perhaps of those which are preparing India's future, are also exotic and not indigenous in their origin. Though modern commercial methods may be a new thing in India, and as yet restricted to a narrow area, it is impossible to doubt either the immense possibilities of expansion which await them in the near future, or the effect which they

have already produced through thousands of channels upon the whole economic life of the country. The influence of modern methods and ideas is far wider than the sphere in which they are directly and visibly operative. Railways, schools, and post offices are changing the outlook of large classes of the population; and the traditional isolation of the Indian village is being slowly broken down.

Examples of Abstract Theory applied to India.

But without entering upon the large and perhaps rather nebulous field of discussion which these considerations suggest, it is easy to point to one topic, recently of burning interest, on which the applicability of abstract economic theory to Indian conditions has been convincingly demonstrated. It is hardly possible to study the history of the rupee, and follow the prolonged discussions which led up to the adoption by the Indian Government of its present currency system, without being struck by the prominence of purely theoretic arguments and considerations, and also by the degree in which these have been justified by the course of events. They have been employed with remarkable success both to explain and make intelligible the causes of an extremely complicated set of circumstances, and also to afford practical guidance in a difficult situation. Interesting testimony on both these points has lately been offered by Sir David Barbour in his recent book "The Standard of Value". The proposals made by him in 1893 as Indian Finance Minister for the transfer of the Indian currency system from a silver to a gold standard, were based, he tells us, on his belief in the soundness of the Quantity Theory of Money. And he expresses the opinion that no stronger proof could be conceived of the essential soundness of that theory than is afforded by Indian experience of the working of the Gold Exchange Standard. The whole of India's recent currency history is full of most instructive illustrations of the application of theory to practice; and it need hardly be insisted that some study of abstract theory is necessary in order to understand it.

To pass on to a more dubious instance let us take the Ricardian theory of rent. It might seem at first sight that here at any rate we have a doctrine wholly out of relation to Indian conditions. The rents which in India are actually paid by tenants to their landlords vary between wide extremes according to the form of tenure, and are largely governed either by custom or by legislation. They seem to have little connection with "economic rent", or the rental value which the land would have under a system of unrestricted competition between cultivators. Similarly customary wages seem to be independent of causes affecting the demand and supply of labour. It has been shown however by Sir Theodore Morison that in such cases there is often a closer relation than appears on the surface between the real amount paid and the rate of payment which economic theory would suggest as probable. Even where custom appears to be, and is accepted as, the sole factor in determining payments, a more searching enquiry often shows that competition plays an unseen but real and important part. If long periods are taken, customs themselves may be found to alter under the pressure of competitive forces. New customs arise, and old ones die out, or are modified in response to changes in economic conditions. Take, for example, the Metayer or (to give it its local name) Bhaoli system of land tenure, which is common in this neighbourhood. On this system rent is on the face of it entirely fixed by custom at an unalterable share of the gross produce. But when the rent paid under this system falls much below the rental value which the land would have under competitive conditions, there is a common tendency, in defiance of custom or law, to augment the amount actually paid by extra charges in the form of one or other of the various species of "abwab". The customary rent remains nominally unaltered; but by a proceeding of the nature of a legal fiction the real or virtual rent is pushed up in conformity with changed competitive conditions. In this and other instances it is far from true that there is any complete discrepancy between the abstractions of theory and the concrete conditions of Indian experience. On the contrary it has been shown by Marshall

and other economists that they can be made mutually illuminative. Indian facts become more intelligible in the light of abstract principles ; and these principles themselves often reveal possibilities of development and extension as well as limitations, when the attempt is made to apply them to a new and apparently alien set of facts.

Economic theory in Education.

Perhaps enough has been said to shew that even from a "practical" standpoint the old-fashioned type of economic theory has a relevance to Indian conditions which no one who wishes to understand them can afford to neglect. There is however one kind of practical standpoint—not always recognized as such—from which I may be allowed to say a few words, as it is the standpoint from which I have to take my own personal bearings. I mean the pedagogic or educational standpoint. As part of a course of education, I believe that there are few studies which have so high a value for purposes of mental training. It is at once a stimulus and a discipline for the mind. Merely to follow the deductions of "the old school", and to test one's understanding of them by applying them to real or imaginary cases, is an exercise in applied logic, which not only strengthens the reasoning power, but also (which is perhaps an even more important matter) tends to create a habit of regarding the subject under discussion from the point of view of reason and not of prejudice or party feeling. If studied on right lines, and with a reasonable degree of thoroughness, it is a subject which has the cardinal merit of compelling the mind to active exertion, and dragging it out of the purely receptive attitude into which aspirants after examination successes are almost always prone to sink.

It is not necessary, I think, that the study of theory should be carried to as high a point of refinement and elaboration as is reached *e. g.* in the writings of Winser and other economists of the Austrian school. What is rather wanted is thorough understanding and grasp of certain broad elementary principles,

including a mastery of the processes of inference by which they have been established, and of their basis in reason and experience. Apart from the question I have been discussing of the applicability of such principles to Indian affairs, there can be no doubt that a clear understanding of them is in any case useful as a safeguard against certain kinds of fallacious and confused reasoning, which are by no means rare among amateur economists, and are as easily perpetrated in India as in Europe. Old errors associated with the Mercantilist or the Physiocratic standpoint are continually being revived in subtle forms, and often have a plausibility that is likely to deceive any one who has never tested their theoretic foundations or followed out in a thorough-going way the arguments by which they have been long ago refuted.

Study of Facts.

I have spoken at some length on the deductive side of economic study, because I think that at present there is a tendency to neglect it unduly. But there are inductive branches and methods of study which it would be even more fatal to neglect. A clear grasp of the main principles established by abstract theory is not the whole or by any means the major part of what is required of the Indian economic student. It is merely a highly serviceable (and for some purposes indispensable) part of his preliminary equipment. The more interesting and much more important part of the work which awaits him is work of a newer and more adventurous kind. There is a vast area of practically untrodden ground to be explored and mapped, and to be brought by slow degrees within the domain of ordered knowledge.

In this department of our study, theory must for the present, as it seems to me, play a strictly subordinate part. Whatever value the study of abstract principles may have as an introduction and aid to the study of facts, it cannot be denied that (especially in India) there is as yet a considerable gap between the two; and while accepting all the suggestions and

guidance that theory may be able to offer, it is necessary to avoid being too much preoccupied with theoretic considerations. There is less danger of our judgment being warped by theoretic-al than by practical or sentimental prepossessions ; but it is a danger which sometimes has a real existence. It is occasionally necessary to remind ourselves that, in the end theories have to be fitted to facts, and not facts to theories. For this reason, and in order to make sure of keeping an open mind, it is often best to put theory for a time entirely on one side, and to study mere facts on detached and independent lines. So long as one is merely collecting materials and gathering evidence this is doubtless the right attitude. Later on there is a time for testing theories by enquiring if they are applicable to the facts which have thus been independently ascertained.

At the same time there is little doubt that through the whole process of "realistic" study the theoretically trained mind has certain advantages, which more than counterbalance the danger of doctrinairism. It is less prone to the unconscious type of fallacious theorizing, and the subtle perversion of facts that commonly ensues from it. And it is also more awake to the observation of antecedents and consequents that are not on the surface noteworthy, but may be important as links in a causal sequence.

III. AIMS AND POSSIBILITIES IN INDIA.

It would however be a piece of gross academic presumption to imagine that a theoretic training is absolutely indispensable for the accomplishment of any useful work in this field. Any moderately intelligent person, with an open mind and a habit of conscientiously accurate observation and statement, is qualified to render valuable service in extending the common stock of economic knowledge. Merely to observe and record facts in a trustworthy manner is doubtless a less easy task than it sounds ; but it may be carried out successfully without undergoing a special course of training, or qualifying oneself to be called an expert.

A suggested Programme.

What is wanted above all in India is systematic cooperation between the economic student and the man of practical experience. As far as concerns the special study of Indian conditions, the work to be done falls broadly under three heads; and under two of these experience and working knowledge are of decidedly more importance than theoretic training.

(1) There is first the task of collecting and arranging facts. This appears to me to be at present the foremost need, and to offer widest field for useful labour. It is true that masses of historical and statistical material already exist in a more or less systematized condition. In Settlement Reports, Gazetteers, Reports of Commissions, and of Government Enquiries on special subjects, stores of varied information and evidence are to be found. But the knowledge there gathered has in the main been collected for special purposes, and is presented from special points of view. The common element in it all is that it is acquired through the administrative machinery of Government, and primarily with a view to administrative requirements. This does not necessarily lessen its value; in fact in some respects it undoubtedly enhances it. Government obviously has means of obtaining information on a wide scale, which are not available for private individuals; and there is the strongest motive for accuracy when the information obtained is to be made the basis of administrative policy. But on the other hand there are inevitably gaps and deficiencies which can only be filled by systematic private investigations. The material supplied in Blue Books is a part, and an enormously valuable part of the evidence which private enquirers have to study; but in order to build up a sound and comprehensive body of knowledge, a great deal of additional material is needed, which must be obtained by investigations of a more searching and detailed kind. All the knowledge to be acquired must ultimately be based upon particular facts; and the particular facts which are of overwhelming importance in the economy of India are facts affecting the lives and circumstances of men living in villages.

Government is the only agency which can ascertain these facts over a very large area; but the nature of the machinery through which wide-reaching investigations of this kind must be made, imposes certain limitations, both in regard to the questions that can be answered, and also in many instances in regard to the value of the answers that can be obtained. The ultimate source and authority from which Government derives a large part of its supplies of local information, is, I suppose, the village chowkidar. Information so derived, even when revised and supplemented by intelligent guess-work on the part of higher authorities, is likely to be in some respects defective. What is required generally, in order to supplement information of the type supplied by Government, is study of an intensive kind, restricted to a narrow area, and entering thoroughly into concrete details.

There is one circumstance which in India makes it absolutely necessary that enquiries should be carried out on these lines, if any real progress is to be made in our knowledge of Indian economics. This circumstance is the amazing variety of local conditions. There is no country about which it is more dangerous to generalize. This is obvious enough about India as a whole ; but it is also true regarding each province, and often regarding minor divisions within each province. As regards *e. g.* this particular part of India, the fraction of a province that goes under the name of Behar, there is a sufficient diversity of conditions in the Patna Division alone to offer a wide and varied field of " realistic " study.

We have in the Patna College an association of students, known as the " Chanakya Society ", which exists for the purpose of collecting and discussing local evidence regarding economic conditions. Its work may be taken as an illustration of the type of study I am now advocating. One of its members will, I understand, read a paper on the work of the society before this Conference. This will perhaps enable members of the Conference to judge of the utility of studies carried on along these lines ; and will also, I hope, elicit valuable criticism and advice regarding the particular methods which the society

is following. I am now however only referring to it in order to illustrate what I have just said about the diversity of local conditions. Practically all the members of the society are Beharis, and most of them, I think, belong to this division ; but one of the most instructive features of its proceedings is the variety of the conditions with which its members are acquainted. At the earlier meetings of the society whenever any general discussion arose concerning such questions as conditions of land tenure, agricultural customs, or rates and mode of payment of wages, it was the usual thing for its members to begin to contradict one another. Each spoke from his own personal experience ; and the conditions of which they had knowledge were often totally at variance. The inference is that detailed local evidence must be collected in large quantities before it is possible to make any profitable attempt at generalization even within the limits of an apparently homogeneous fraction of a province such as South Behar.

(2) Under the second head comes the analytical and comparative study of such evidence as has been accumulated. This is work for which a theoretical training in economics, and some study of European as well as Indian conditions is a necessary qualification. I am inclined, as I have said, to regard this work as on the whole less important at present than that which comes under the first head. It will become more important as the available body of evidence and material becomes larger. It is impossible, however, to postpone it altogether. The two processes of collecting and analysing facts must go on together, and can never be wholly separated. By analysis and comparison we are enabled not only to generalize from evidence already accumulated, but also to learn in what directions further evidence is to be sought, what classes of facts should be collected, and what questions should be asked. Again while it may be allowed that the study of Indian economics as a whole is not yet ripe for systematization or for theorizing on a comprehensive scale, it must also be recognized that there are many branches of the study in which the theory and experience

of Europe have already been successfully employed to throw light upon Indian problems. To establish this, it is only necessary to refer again to Mr. Ranade's essays and the works of Sir T. Morison, or with even more relevance to Dr. Marshall's evidence before the last Indian Currency Committee.

(3) Thirdly and lastly, we come to the study of directly practical issues. In most of our minds probably this is the end to which the two former branches of study are subordinate. The mere acquisition of knowledge would not attract us unless we believed that it could be made to serve practical ends,—to remedy evils, and be instrumental towards progress and improvement. There are some no doubt who will tell us that this belief is a mere illusion,—a vain dream of the academic mind,—and that for practical work not theory but practical experience and capacity are wanted. Examples will be adduced of enterprises that have broken down and reforms that have proved fruitless. That is what always happens, we may be told, to the schemes of theories and visionaries ; it is only the practical men who put things through, and they do not trouble themselves about theory. Fortunately the object can be met with notable examples to the contrary. The remarkable success for instance of the Cooperative Credit movement both in Europe and in India may well be regarded as the realization of a vision. No doubt it also exemplifies the necessity of practical insight and experience in addition to, though not as a substitute for, clear thinking and wise knowledge. This much may be granted to the objector,—that theoretical knowledge by itself is not a sufficient equipment for the work of practical reform,—and also that bad theorizing may be much worse than none. But it is unnecessary to argue seriously against the view that theory as such is of no practical use whatever. No one not even the most narrowly “practical” among us can help theorising to some extent ; and if we have to theorize at all it is plain that the more sufficiently we do it the better. All sound practice must, whether consciously or not, be based upon, or at least in accordance with true theory ; and the practical man who has a

clear grasp of true theory has, so far as that goes, an indubitable advantage over one who works unconsciously or by rule of thumb. It is only by a patient and thorough-going course of study, in which the teaching of theory and experience are combined, that results of any practical value are likely to be reached ; but the outcome of such a study should be the attainment of a standpoint that is practical in the best and widest sense. There are two opposite forms of error that it may help us to avoid. One is the error of the "hard-headed practical man" to whom all obstacles to improvement are insuperable, and everything except the ordinary and customary way of doing things is outside the range of practical politics. The other is the more pleasing and more insidious fallacy that obstacles of any kind are non-existent or negligible, and that there are easy ways,—such as taking the swadeshi vow or passing resolutions at public meetings,—by which a new economic world can be brought into existence. One form of the latter type of delusion is a belief in the practical efficacy of uninstructed enthusiasm, another is faith in the economic omnipotence of Government. Instruction in economics is a useful safeguard against both, if it gives us some insight into the complex forces by which economic issues are decided, and enables us "to see the unseen" and to realize that the most obvious shortcut is not generally the way that should be chosen.

It would take me too long to give even a moderately comprehensive list of the practical problems which await solution in the India of to-day. There are one or two problems of high importance, such as the problem of Famine Relief, and perhaps also the Currency Question, which may be said to have been solved already (so far as the main principles involved are concerned) by the efforts and experience of the past half century. Of the complex group of problems which might be brought under the general head of Famine Prevention, there are some which have been hardly touched, and others which are or appear to be at various stages on the way to solution. The organization of credit, the popularization of improved methods in agriculture

and industry, the improvement of relations between landlord and tenant, the utilization of sleeping capital, and the thorny problem of organizing charity and discouraging the "sturdy mendicant", all these are practical issues with which the future of India is vitally concerned. They are all questions which call for patient study as a prelude to experimental action ; and they open up a field of co-operation both in study and action between all who are honestly concerned for the well-being of the country.

I have been speaking from the point of view of the student of economics, and trying to show that economic studies have a practical bearing on such questions, and are capable of practical service in the task of solving them. But I do not wish to exaggerate this claim. There are broadly three standpoints from which these problems may be approached, and three sets of persons concerned with them. Economic students are one of these sets of persons ; practical men interested in the material progress of the country are a second ; and the administrative officers of government are a third. I do not think that any fair-minded person can doubt that up to the present time it is the last of these classes that has borne the burden and heat of the day, and has achieved the major part of such success as has so far been accomplished. It rests with us the students, and with you the practical men, to take our fair share in the work that remains. It is work which needs the co-operation of all three parties ; and there is no work which offers to common and organized endeavour a large promise of fruitful results. Many of the problems involved are extremely complex and difficult ; and that is a reason why they should be attacked from as many points of view as possible, so that all the light of knowledge and experience that is available may be brought to bear upon them. They can hardly be solved by individuals working separately. Probably many of them will never be finally or completely solved ; and partial solutions are only likely to come as the result of the joint and organized labour of many workers. But the whole field is one on which a work of real service may be accomplished by any one who enters upon it with a single

mind and in a spirit of thoroughness and sincerity. I doubt if there is any aspect of Indian affairs to which the watchword given by the King-Emperor to this country is more directly and luminously applicable. From the economic standpoint no sane man can doubt of the progress that India has lately made and is now making. About the future sane men do not prophesy. Remote prospects must always be uncertain ; but the present outlook at least is full of hope. In every direction are traceable " the signs and stirrings of new life ".

THE PATNA COLLEGE CHANAKYA SOCIETY.

“ कृषिपाशुपाल्ये वाणिज्या च वार्ता ।
धान्यपशु हिरण्य कुल्यविधिप्रदानादौपकारिकी ॥ १. ॥ ”

‘Agriculture, Cattle tending and trade constitute Varta (Economics) is serviceable in causing increase of grain, cattle, gold and other metal's and labour.’

—*Chanakya's Arthashastra.*

The Chanakya Society is a small association of the students of the Patna College. It was founded on the 8th Dec. 1909 at the suggestion of, and on the lines, laid down for it by Professor Russel. The Society has been named after Chanakya, the great friend, guide and philosopher of Emperor Chandragupta. The members of the society thought that they would be doing their duty by paying their humble share of tribute to the foremost statesman, economist and political philosopher of ancient India, whose field of activity was Patliputra, the modern Patna, where the Society had the good fortune to be established.

The Society was established with the immediate object of providing for its members an open field of original research and of enabling them to develop a spirit of intensive study and an analytical method of investigation. The ultimate object we had in view was to collect as detailed and trustworthy first-hand accounts as possible of the economic and social conditions of the people and villages around us, in the fond hope that they would be of interest and use to the future economists of our country.

The society has opened a vast and untrodden field of useful work for its members and has been of immense help to buys affording facilities for carrying on independent enquiries into the practical value of abstract economic doctrines by enabling us to study these doctrines in connection with concrete facts. It thus supplements the knowledge we gather from our books and lectures and makes up for the deficiencies of the system of education adopted by our University, which encourages a habit of getting up things without the minimum of attention to their significance and thus, instead of developing, chills the innate power of the students under the heavy load of the huge unassimilated information it wants them to be ready with for their Examinations.

The programme of work which the society started with consisted of enquiring into the condition of villages in Behar. This enquiry was carried on under the following five main heads, each variously sub-divided:—

A. Area and situation of the village.

B. Population.

C. Village organization.

D. Land Tenure.

E. Condition of the cultivator.

We followed this programme for a pretty long time and collected a goodly number of village reports. The programme was subsequently extended and enquiries were made into several kinds of tenures of land that obtain in our villages, the mode of assessment, the manner in which rents are collected and the incidence of revenue per bigha. The reports also deal with the items of litigation and show that real suits are more frequent in places where the Guzaratin system of land prevails. From the reports received on the condition of the cultivators we noticed that the tenants in villages under the Bhaoli system (which prevails mostly in the Gaya district) were worse off than those

under the Nakli system (which prevails *e. g.* in Shahabad). In spite of the Tenancy Act being in force in all the districts the Bhaoli system seriously impaired the utility of its provisions in Gaya. A large class of the ryots were entirely under the thumb of the Zemindars who treated them very much as they liked. With regard to the Village reports there is one striking point worth mentioning *viz.* that they seldom agree with one another in various points of importance. Hence it is to be concluded that there is nothing like a typical village in any district, much less in a division or province.

Finding that the work of village enquiry entailed a much heavier work than we had imagined and discovering that it was not of so great an immediate interest to us in the method of intensive study that we had adopted, we gave it up for another as we thought of greater interest and practical utility. We adopted the system of enquiring into the condition of families. We did not fix upon any definite heads under which our investigations were to be conducted. The members used to gather as much first-hand information about the general conditions, fooding, income, expenditure, debts etc., of a family generally of the cultivating classes, as they could. We collected a large number of such family budgets from the different parts of the province. Our chief object in collecting these family records and budgets of villages was to know as much as we could of the condition of our labouring classes.

But in the October, 1911 (vol. IV No. 3) issue of the Indian Interpreter there appeared an appreciatory criticism of our work from the redoubtable pen of Dr. H. H. Mann of Poona. In that note he was kind enough to suggest that our family budgets would be of greater interest if more systematically obtained, with a more definite idea of exactly what is wished to ascertain. He also implied that it would be wise to concentrate primary attention on one or two special aspects of the life of the families and to let the remainder be incidental. This, according to him, would enable a larger number of cases to be gone over.

We are greatly encouraged by this note as well as by another from Sir Theodore Morison, who in a letter to Mr. Russell, the permanent president of the Chanakya Society, greatly encouraged us. Since then, we have been able to secure a copy of Mr. Buchanan Hamilton's invaluable work *Eastern India* and have had the advantage of noticing his method of investigation. In the light of these suggestions and models we have tabulated our family budgets on statistical bases and have prepared a programme according to which our village and family enquiries are to be carried on in future. We have arranged three forms, each containing various fixed headings under which we desire the investigations to be done now. Members have to fill up each form under its various headings and sub-headings, after proper enquiry.

We have been able to get only a few budgets under our new scheme, but we have reasons to believe that it will work well. An idea of our programme may be had by an inspection of the forms attached herewith. (Vide Appendix B.)

Besides this, preeminently the most important work of society which every member is expected to take interest in, there are some others which deserve mention here. To facilitate work, it was deemed advisable to form three standing sub-Committees. Accordingly 3 sub-Committees,—(1) the Agricultural, (2) the Industrial and (3) the Budget—were formed. The first of these investigates all matters relating to agriculture, the second studies industries, and the third sub-Committee arranges the budgets on statistical basis and being in charge of the funds makes necessary purchases for the Museum of the Society.

To enable the members to carry on their work, expedition are undertaken to places of economic interest such as, Patna city, Dinapore, Behar and the Agricultural farm ; and also to the Sonapore and other fairs to study cattle breeding etc. The reports which are submitted are published in the college maga-

zine and are incorporated in the Annual reports of the Society. The Society has received many interesting reports on the various industries in the Province *e. g.* the stone work in Gaya, the Sphatika Rosary Industry at Bindidih in the Behar subdivision of the Patna district, the Fruit Preserving Company of Muzafferpur, the Button factory at Heli in Champaran, the Cotton and Silk industries at Behar and the Iron foundry and Oil mills in the Patna city.

The members are required to visit the Agricultural and Industrial Exhibition held from year to year and to study and report on the various products exhibited. They are to mark the changes, if any that may be perceptible in the quality of the articles exhibited. The reports show what industries there are in the province, what new industries have been started in course of the year and with what prospects and how many of the industries established are dying and why. Very few of the industries we have enquired into show signs of a healthy life. Most of them suffer from want of patronage. But no less do they suffer from inherent defect in their own organization. They start with insufficient capital, bad management, lack of business capacity on the part of those responsible for their superintendence, and an utter ignorance of the wants and tastes of the customers. The majority of them are too petty to live long and die a natural death. But we have no hesitation in saying that some of these would turn out to be of great importance and world-wide fame if sufficiently financed and properly organized, *e. g.* the Fruit Preserving Company of Muzafferpur, the Mica mining industry of Gaya, etc.

Ordinarily a meeting of the Society is held once every month. In these monthly meetings the reports of the members and the family budgets collected are discussed and criticised. These meetings are open only to the active members of the Society. But we hold an annual public meeting in February or March every year. These meetings are open to all and the annual report of the work of the Society is presented here. Criticism

from outside are invited and if useful are gratefully acknowledged. It being the object of the Society to be acquainted with and appropriate truth from all quarters, we want our work and methods to be criticised and our defects pointed out to us. We place an account of the constitution, methods, and works humble though they be, of our association before the delegates assembled here from all parts of the country in the hope of receiving valuable suggestions from able, experienced and practical businessmen as well as from thoughtful and learned economists and doubt not that these will be coming forth in abundance. Might we not hope, if our work is appreciated and is found to be of some use that similar societies will be established all over the country through the influence of the well wishers of the country assembled here from distant provinces, and that these will co-operate with each other in gathering materials for, and ultimately, in the making of, a complete, thorough and unprejudiced system of Political Economy for our country.

APPENDIX A.

CONSTITUTION AND RULES OF THE CHANAKYA SOCIETY.

1. The objects of the Chanakya Society are:—
 - (a) To study the social and economic history of Behar.
 - (b) To carry out local enquiries into present economic conditions.
 - (c) To discuss and, if possible, to promote the introduction of improvements and reforms of an economic character.
 2. Ordinary membership is confined to students and professors of the Patna College ; but gentlemen not belonging to the College who are willing to help in the work of the Society are eligible as Honorary Members.
 3. The Society will meet once a month.
 4. At each monthly meeting all work done during the past month by the members will be reported and discussed and a programme will be adopted for the next month.
 5. Every ordinary member on joining must undertake to carry on some kind of continuous and systematic enquiry on behalf of the Society.
 6. Small expeditions will occasionally be made to visit and inspect local industries.
 7. Members may subscribe any sum they like towards the Society.
 8. Such subscriptions together with any grants which may be made from "the New Fund" of the College will be applied in the first instance to forming a collection of the cheaper products of local industry. Money may also be spent on travelling expenses for purposes of enquiry and on copying and printing charges.
-

DIX A.
Budget.
A).

Income.								Total Value.			Remarks.	
Income in money.	Income in Grain.	Value in money of the grain.	Other paid in kind.	Its Value.	Services rendered.	Presents.	Value of presents other than cash.	Money Borrowed.	Rs.	A.	P.	

DIX B.
Budget.
B).

Dhobi.		Extraordinary.	Remarks.
Cash.			
Kind.			
Value.			
Potter.			
Blacksmith.			
Carpenter.			
Priest.			
Interest on Debt.			
Repair of house.			
Tobacco, Pan, etc.			
Intoxicants, Wine,			
Toddy, Bhang, Ganja,			
Opium etc.			
Pujah.			
arrage.			
Entertainment of guests.			
Education.			
Pilgrimage.			
Donation, alms, etc.			
Total Expenditure.			

DIX C.
Return.

Fish.	Ghee.	Sugar.	Vegetables.	Oil.	Lamp.	Bases of Enquiry.
Daily. In cheap Seasons only. On Special Occasion. Never.	Daily. In cheap Seasons only. On Special Occasion. Never.	Daily. In cheap Seasons only. On Special Occasions. Never.	Daily. In cheap Seasons only. On Special Occasion. Never.	Daily. In cheap Seasons only. On Special Occasions. Never.	Kerosene oil, Candle or gas. Indian oil lamp.	Evidence. Guess.
						Remarks.

WORK=A-DAY INDIA.

BY

Frederick Noel Paton,

Director General of Commercial Intelligence, India.

"Rights outside India reserved."

The purpose of these conferences is to lay plans for the future. It is right that we should consider that things that remain to be done or improved, rather than the things that have been accomplished. But as I travel about the country and notice the diversity of the industrial and commercial activities already in operation and the degree of organization to which we have attained in prosecuting them, I come to doubt more and more whether the day has not gone past for speaking of India as if it were still a raw material. I am sure that persons abroad fail to realise how far India has advanced in commercial organization. A good many Europeans in this country are disposed to gauge by western tests the organization which we have evolved and to conclude that, where our organization is different in kind from that encountered in the western world, it must necessarily be inferior in efficiency. And Indians with no foreign experience are a little prone to be disheartened by the legend that their organization, being less uniform, is necessarily inefficient. We all know that in many cases our organization is less precise, less rigid in its operations; and the prime purpose of our conferences is, as I have said, to ascertain in what respects greater precision and greater simplicity can be introduced with advantage. That also is the purpose of much of my own official work. We must bear in mind that as a rule a system evolved by a multitude of compromises is usually less uniform and more complex than one that is erected on a set of principles already formulated, although these principles may in fact have taken

form from experiment. High organization in fact commonly consists in simplification. But such simplification usually involves a departure from usage, and so at first sight looks like complication. While a highly organized machine may, under uniformly suitable conditions, work with greater precision than a rudimentary one, it does not follow that under variable conditions precision will result in efficiency. A steam plough may be enormously more efficient than an ordinary plough where the fields are large and free from obstacles, and yet be utterly inefficient in tilling the small patches into which holdings in parts of India are almost necessarily divided. A motor wagon may be more efficient than bullock traction on a perfect road; but what if there be a slough at a ford or one weak culvert? It is our business to take stock not only of the points at which organization must be improved and simplified, but of those at which it appears in fact to be fairly efficient. And it occurs to me that it might interest you if I could put into words some of the impressions of work-a-day India gathered by a person who has visited most parts of the country, seen most of her trades and industries in operation, and talked with most of the leading men who are conducting them.

And how variegated and interesting are these impressions! Calcutta with its teeming river, its jute and coal and tea, its splendid open spaces and its whole-hearted enjoyment of a grievance. Bombay with its enterprise and self-confidence, its magnificent harbour and thundering surf, its hundred cotton mills, its splendid docks and its cosmopolitan populace pushed into the gutter by pervading railway tracks. Madras with its growing port accommodation, its multifarious industries, its wide Marina and spacious compounds and its kaleidoscopic costume that flutters and glints in the fresh sea wind along its sun-flecked wooded roads. Karachi, an oasis of sun-baked brick, and superb bumptiousness growing indomitably between twin deserts of sea and sand; Karachi with its tentacles fixed in the rich wheat hinterland; with its problems, programmes, propositions, its camels and its dust devils stalking suggestively

from the grading yards. Two thousand miles away, the great golden pagoda of Rangoon gleams through the smoke of a hundred rice mills and steamers and the quivering vapours that rise from vast oil refineries ; while the most engaging and alterly supine people of the East pass in tramcars to its gates, and elephants wrestle with teak-logs along the muddy shore. Cawnpore, versatile in enterprise, with its cotton mills, woollen mills, sugar works, leather works, brush works, distilleries. Heaven knows what—a city whose past is atoned for by the successful co-operation of West and East. Delhi, the Indian prototype of Rome with its forum and campagna and all the debris of a tremendous and sinister magnificence stretching in serried aloofness to the horizon and dwarfing the smug architecture of to-day as Kiuchinjunga dominates Darjeeling. Madura with its handlooms and its muslins, its temple of splendid vistas fretted with sculptures that show, above all, what ugliness of form and conception may be venerated by pedants in art. Go where you will, you find the rising stream of skill and welfare creeping across the country ; and it is our task to lead it in the right directions as an irrigation officer conducts his fertilizing flood.

But please understand that my intention to-day is not to instruct. My purpose is one that would be much better performed by a cinematograph. I want to call up before you a set of pictures of a few characteristic industries and trades in India and to leave you, if possible, with a greater pride in our country than before, and a deeper respect for that co-operation of East and West by which we have advanced so far and without which we should go no further. Nothing could testify more strongly to the desirability of a partnership between the resourcefulness of the Britisher and the adaptability of the Indian than the accomplished evolution of commercial and industrial methods possessing all the flexibility required in a country like this.

But how is it possible in the scope of a short paper to give you even the vaguest impression of the magnitude of India's economic phenomena or of the skill, patience and enterprise that have planted industries in the remotest corners of the Continent ?

Four hundred millions of people ! One million seven hundred and seventy square miles each with 640 acres ! These vast figures are entirely out of relation to the largest number of people we have ever seen or to the widest expanse that our vision can reach, and they convey no exact meaning to us. A score of millions one way or another would not affect the general impression. Even when we say that British India and Burma are supposed to comprise about 270,000,000 acres of arable land, of which 223,000,000 acres are actually cropped, the statement calls up no image and remains a mere arithmetical expression. We only begin to grasp the grandeur of the affair we are concerned with when we picture the size of one acre—when we remind ourselves that one raiyat can till only about two acres, and when we consider that every one of those 223,000,000 acres is gone over, foot by foot, not once a year but repeatedly in every year, by that indomitable, pertinacious little animal called man armed with a piece of iron on the end of a stick. When we reflect that every clod in every one of those wide fields we see from the window of the train has been turned over, and possibly handled, by man within the last few months, the soil seems to be part of humanity, and the tremendous statistics of production and exportation appear insignificant beside the vast and vital function that is being preformed under our eyes. It requires an effort to focus one's mind to the thought that every one of those people is an individual whose eyes and whose thoughts have been possessed through days and months and years by some few square yards of land to us undistinguished from the rest.

The most vivid impression reproduced when I close my eyes and switch my mental vision over the memories that range from Burma to Karachi and from Chittagong to Cochin is that of a vast anthill with a swarming and countless populace hurrying to and fro. An impression, you will say, gathered in the market place ! Certainly not the impression of the district officer or of the forest officer in the jungle ! In the lonely places, one may recognise the ploughman, the wheelwright, the weaver, the fisherman by the insignia of his calling ; but the great mass of

the labouring classes—the *munghi-log*—that one sees hastening in all directions—are engaged on errands and activities which we shall never know, and the true bearing of which is in very many cases only half understood by the emissaries themselves. And yet every one of these obscure and mysterious individuals is a part of one of the greatest machines in the world—your machine and mine, in which we must have a common pride. Every hut we pass in the roaring express train is the centre of the universe to some of these people. They think of themselves only as individuals and do not know that they are parts of the machine. Yet the implacable law of supply and demand, which they never heard of, moves them sooner or later to that place or to that occupation in which they can best contribute to the general advance. So we see, on every hand, the people hastening to and fro, the soil turning under the plough and spirting from the mattock, the seed being scattered and the sickle wielded, the cattle toiling along the roadways with loads of produce destined either for a foreign continent or for some part of India whose very name has never been heard by the grower or the carrier.

By the paths and roads of Eastern India and of Burma, near the closing of the year, the dribblets of India's greatest product, rice, begin to move, carried in baskets by the countless *munghi-log* or in carts of quaint pattern drawn by that conscientious but ineffectual objector the bullock. By clumps of bamboo, that wonderful plant which furnishes everything from masts to paper pulp: through groves of mahogany or teak or "sundri" to which the timber users of the world will have to turn in years to come: past swamps where sugar-yielding nipa palm contends with mangrove and a dozen other tanning materials, come the dribblets of rice in picturesque craft propelled by oar and sail along the beautiful creeks that swarm with fish. And the dribblets merge in runlets, and the runlets in streams, and the streams in a vast flood that covers the face of the sunny rivers, and chokes the railways and surfeits the mills, and pours out from them across the sea in scores of ships, feeding

the famine-stricken further East and swamping the markets of Europe till they can take no more at any price.

A little later, and the North and North West are rustling from end to end with golden wheat and oilseeds. Here, as in the river tracts, the cattle circle, treading out the corn ; and, when the wind blows well, the landscape twinkles with a hundred thousand little jets of chaff and grain thrown heavenward for winnowing as if in an ecstasy of thank-offering. Here the whir of the reaping machine and the hum of winnowing and sifting machines introduce the note of progress ; and the cultivators talk in moments of leisure about the great elevator bins that are being erected at Lyallpur in order that large quantities of wheat may be stored in safety and despatched expeditiously by rail. Here as in Burma, the railways become choked with produce. Mountains of grain accumulate in the goods yards and godowns. The traffic officers are besieged with demands for waggons, ships lie in the harbours waiting for cargo that cannot get through, the telegraph wires vibrate with protests from indignant merchants. Then perhaps comes one storm and in twenty-four hours destroys wheat and seeds to the value of many elevators ; and still the merchants clamour for more waggons. British India produces some 30,000,000 tons of rice every year. The yield of wheat in all India is about 8,400,000 tons, and her yield of linseed and rapeseed about 2,500,000. The value of the rice is believed to average about Rs. 333 crores and that of wheat about Rs. 73 crores. But the producer is not in a position to hold very much of his grain crops in security. He has to sell a large portion at harvest time for what he can get, because he wants ready money. He is somewhat less pressed in this respect than he used to be ; for he has as a rule made good profits for a number of years ; but he is still without means of storing his grain in safety, and if he holds it under prevailing conditions he is likely to lose through deterioration more than he sacrifices by immediate sale.

About one-fifteenth of India's recorded rice crop is shipped abroad, and about one-ninth of her wheat. There are times when high prices draw much more than these proportions into the exporter's hand ; and—more particularly in respect of Burma rice—there have in the last two years been moments when exportation has been made on such a scale as to create some danger of famine. For Burma is badly furnished with railways ; and the traffic on her waterways and the mechanism of her trade are of a kind not easily utilised for the distribution of supplies. The steamers of the Irrawaddy Flotilla Company ply on the main channels ; but they could not find their way into all the smaller creeks to which supplies might have to be carried in time of shortage. It must, however, be remembered that the circumstances of the rice trade in the past two years have been altogether exceptional and have resulted from extensive and simultaneous failure of crops in a number of other producing countries. It would be hard on the cultivator if any measures were instituted to restrict his sales at profitable rates when he had a surplus to dispose of—especially when no proper means exist for its preservation. If he were not free to make hay while the sun shines, there would be no inducement to him to extend his cultivation, and he would not now be shaking off the shackles of the money-lender as he is doing. The question of furnishing the cultivator with better means of storage is one of the matters in which the time has perhaps come for a further adoption of western methods, and certainly for the systematic study of all the aspects of those methods as adapted to India's trade in rice, wheat and seeds. The congestion on the railways seems always to be at its worst in the season for wheat and seeds ; and it is commonly spoken of in India as resulting from inadequacy in the supply of rolling stock. But in other countries it is held useless to multiply wagons without adopting the complementary elevator equipment that enables a railway to handle its wagons quickly. What is the use of ten buckets at the well if you have only one draw rope ?

This is one of the weak points in our mechanism of the trade. On the other hand the organization for bringing the produce together, though it may be different from that in Canada or the United States, is not truly primitive. I once quoted to a learned professor a statement which I had read, to the effect that birds represented one of the lowest forms of life. I was pleased when he replied : " That is just the sort of nonsense that pedants talk. A bird is as highly developed on its lines as we are on ours." Similarly, our commercial system is in reality highly developed and fairly efficient. All over the country, in Burma as in India proper, the middlemen swarm for months before the harvest time—making advances, arranging terms, and distributing the jute bags and bale-covers for the coming crops. Through the channels of bank and treasury, the flood of rupees begins to rise and flow. Day by day and hour by hour the cable advices from the foreign markets tell the great export firms the prices obtainable ; and the inland wires carry the news to hundreds of local agents in the districts and the upcountry markets. The systems on which these middlemen act are almost infinite in their variety ; but this, so far from being a defect in our practice, is evidence of its extraordinary flexibility. It is true that in some places the complex and obscure nature of our weights and measures puts too much power into the hands of the broker and leads to practices under which a good deal of the money that passes sticks to the hands of middlemen by no means indispensable. This condition is peculiarly prevalent in Burma where rice is brought and sold by the hundred baskets, while the baskets are of every conceivable size and capacity. Government has refrained from enforcing reforms in the matter of weights and measures, knowing that the people would themselves ask for such reforms sooner or later. And the frequency with which in recent years Indian merchants of all degrees have raised this question in their conversations with me, shows that the movement is gathering strength not from any theoretical predilection but from realization of the inconvenience and waste incurred. Here again is a sign of practical progress made.

But we must back to our crops.

Before the season of wheat and seeds is closed, the tea gardens of North Eastern India come into bearing. Here there is less appearance of hurry. The beauty of the country, the sylvan character of the vegetation and the slowness of the process of gathering the leaf combine to disguise the underlying activity ; and only in the neighbourhood of the tea house, where we can see the smokestack and the hastening basket carriers and can hear the rumble of the machinery, do we realise the closeness of the organisation.

There is something in common between the spectacle of work in a tea garden and that on a rubber plantation where men move about in the sun-dlecked shade under the trees, tapping, placing and emptying the latex cups and hastening away down wood land paths with covered enamelled pails full of the collected sap. In the factory the latex is mixed with dilute acetic acid or other substance designed to coagulate it ; and then, when the surplus water and the acid have been squeezed and washed from it, it is carried to the drying room or smoke l. Here as in the tea garden the outdoor work is skilful and delicate and there is little evidence of man's strenuous driving power except in the many blackened stumps and fallen trunks of great forest trees that show how the primeval jungle has been ruthlessly swept out of existence to make way for one of our new industries said to be already threatened by the chemical synthetist. But even the most secluded tea garden or rubber estate is closely linked with the great organisation of our commerce. Everywhere the typewriter clicks, the weighing scales rock and clank, letters and telegrams, carts or boats or messengers come and go, stores arrive and produce is despatched, wages are paid promptly as the hands file past at an appointed time. In the dispensary, drugs are administered or wounds are dressed ; and even the local shopkeeper finds a limit set to his predatory instincts by the iron handed management.

With the rains, the jute crop rushes up ; and by July a man may lose himself for ever in it, as troops in certain wars have lost themselves and been burned in the wide plains of maize. The spectacle of the jute country before the crop is cut has something in it suggestive of the great wheat tracts in the Canal Colonies of the Punjab. On every side, and right to the horizon, stretches a sea of velvet green broken only by clumps of trees. But whereas in the Punjab colonies the trees are mostly young and the foreground one of very dusty and well-worn road, in Eastern Bengal the trees are of every age and form ; and the foreground is a winding waterway, with gypsy colonies living on pileborne houses high above the marsh, and with boats plying to and fro with store of fresh jute on board and alert-looking owners at the helm who answer the passing bid of the European in the launch with a prompt quotation fifty per cent. higher. By the middle of August the movement of the jute crop in a good year becomes pandemoniac. The country reeks with the retting and steams with the drying of the fibre. Every craft that will float plies to and fro continually, carrying the tawny freight to the local markets, to the depôts of the big firms, and thence to Calcutta or to railway points. And here too is an organization close in all its links, extraordinarily efficient in its way, and entirely above any charge of primitiveness. No doubt there are abuses almost inherent in it. No doubt there are too many middlemen. But the middlemen are less numerous than they were ; and efficiency is a relative term. A system, however informal, must be held to be efficient if it is attended with less friction and fewer abuses that would occur under one more rigid.

Soon after the flood tide of the jute crop is spent, the cotton boles in the centre and north and south of India begin to swell and burst. India is supposed to have some 22,500,000 acres under cotton and to produce about 800,000 tons of lint with 1,800,000 tons of seed. As the crop develops, the busy people swarm over the face of the land from dawn to dark. Scores of thousands of carts—each with two bullocks and every bullock

with a name that is a household word in some small home—
 creak along the uneven roads carrying the kapas to the humming
 ginneries whose smokestacks multiply yearly against the horizon.
 Day and night the gins roar as they tear the floss from the seed,
 and presses creak and wheeze and clank as they gulp whole stacks
 of lint and spit out steel-bound bales to be hurried to the rails and
 cast into the jaws of the breaker and opener or into the black maw
 of a ship for Japan or Germany. The trains go thundering to the
 coast and then toil back again, light loaded, up the great western
 range for a fresh freight; while others, by day and night, are
 speeding westward from Bengal with jute cloth for packs and bale
 covers, and with coal for mills and gins. And all over the vast
 continent the station lamps twinkle watchfully and the signal
 lights gleam green or red, and busy men speed through the
 darkness in the blazing passenger express that leaves a trail
 of mail bags and bustle behind it while the wires on either
 side throb with the dregs of the day's messages. In the upper
 reaches of the Irrawaddy, the raftsmen work their teaklog
 holding of two months to the bank and tie it up in a gorge that
 is haunted by fierce beasts and by legends of demons scarcely
 less to be feared by these simple folk. Giant trees and colossal
 crags overhang them and break up across the star-strewn sky;
 and the river hastens by, mouthing the edge of the raft and
 muttering invocation to the mists that rise and slowly veil every
 feature. Far as the eye can see only one blurred light now
 gleams, and that is the raft lantern—exorciser of devils. It
 bears the name of a timber firm in Glasgow and burns much-
 travelled kerosene that has made the trip to Rangoon by pipe
 and thence to Myitkyina by rail and down by river through
 one of the most lovely countries that God ever made.

Lower down the Irrawaddy and on a score of other Indian
 rivers, if light be good and wind be fair, quaint craft of every
 kind go lumbering, in the glare of the wheeling searchlight,
 across the bows of hooting river steamers; while out on the sea
 great ships, ablaze with light, go past like glow-worms, their
 engines throbbing like titanic hearts as they grope their way

from port to port or vanish over the horizon towards Europe, Australia, Africa, China, America. As the sun rises over Burma and climbs into the sky, a breath of strenuous life sweep westward across India. In the lonely places the cultivator and the herd go forth uncalled, and the hardpressed weaver clambers back to his loom as soon as he can see the threads. In the cities the hooters bray from point to point. Labourers hasten to their factories, their jute mills, cotton mills, flour mills, woollen mills, rice mills, saw mills, oil mills, sugar mills, dye works, workshops. Then with a crash and a scream the engines start and India is at work again. Down through the passes from the North, the trains of pack animals—mules and yaks, and sheep, bearing wool or borax from Tibet—begin again to creep cautiously, with bell and spear to scare the belated bear. Eastward the convoys push up from Bhamo to the China frontier with freight of Indian yarn and European cloth. Down into the Punjab comes afresh the stream of the brawny Pathan people to batten on the land of plenty which loves to beat its breast and proclaim its destitution. The Chinese quarrymen in the wolfram mines of Tenasserim go to work with the staidness peculiar to their race ; while the Japanese pearl-drivers in the lovely lagoon of Mergui get into their diving dress, without disarranging their carefully parted hair, and drop over the side with a plume of bubbles to their crest. Steam dredgers for gold at Myitkyina and for tin at China Hong and dredgers in harbour creek and river begin to clamour with that querrulous stridency that no other form of machinery can emulate. Great trees in the forest crash to the ground and are hauled to the saw-bench to be turned into sleepers and scantlings. In Rangoon, Moulmein, Bassein, Akyab and all over Eastern India, the rice mills begin to thunder and to cover the estuaries with a scum of paddy husk. In the Hooghly, bargeloads of gunny bags for all parts of the world put off to vessels loading in the stream ; and one after another, great river steam-boats arrive from the Ganges or the Teasta, from Narayanganj or Chittagong, and shake off their attendant flats before moving to their anchorage. Cargoes of coal pour with black clouds into thundering holds and bunkers. Throughout

the waterways of the Bramaputra and the Sunderbuns there moves southward a vast fleet of jute boats that look, in contrast with the graceful rice boat of the Irrawaddy, very much as a cockroach would beside a dragonfly. Once more the bucket that does duty for a cage goes down into the pit at Jerriah or Raniganj. The hauling tackle swings and sings again, and tubs come bumping up the incline laden with the fruits of the last "fall". On the oil fields at Yenangyaung, the beams begin again to rock and thump; and keen-faced drillers from Pennsylvania stand to their rigs, with one hand on the cable, reading the percussion of the bit a thousand feet below. The great new iron works at Kalimati have been aglow all night, their gas-stacks blazing like torches of awakening to the world; but mills and work-hops put on a new activity with the morning. The manganese workings in the Central Provinces resound again to the shot of dynamite and the clatter of falling rocks; and a hundred million little pertinacious men, each with a piece of iron on the end of a stick, are scraping, digging, patting, tearing at the earth at rate of perhaps a thousand million strokes to the minute. Through the beautiful groves of pepperfestooned palms in Malabar, the comely cheery Malayali people, prosperous under the thrifty feminine domination, move to the primitive factories where cocoanut kernels are dried for copra and where their husk is beaten into coir. From end to end of India and up to the furthest limits of her frontiers, speed the post runners of one kind or another. The irrigation officer goes out upon his rounds. The engineer is seeing that his bridge is well and truly laid. The traffic officer is combating a congestion that was not foreseen by him or by any of his mercantile critics who would have quickly made their fortunes had they been more perspicacious than he. The port authority is marshalling in and out the vessels that carry on the commerce of India with other countries. The banks throw open their doors and once again the air is full of the rustling of myriad rupees and currency notes like the rustling of the leaves of a teak forest when a thunder shower begins to fall. In Cutcherry, Secretariat and court of law, officials are at work devising, revising, advising, wherever our machinery has seem-

ed to be at fault. In every merchant's office are men, trained in the technique of their craft, scheming and toiling to bring demand into relation with supply. At almost every point, it is true, the hand that does the material work is the hand of an India. But—be the reason what it may—at most points still the head that has organised and the voice that has taught have been those of the European. It will not always be so ; but it still is true. And there is no lesson that I have learned more clearly by my examination of the industries and trades of India than this. If we are to do justice to the country we must work together, European and Indian, at the tasks we respectively do best. Jealousy or exclusiveness by one or other at this stage of our country's development must have consequences as ruinous as estrangement between old and tried partners who know each other's worth. And irresponsible talkers who are willing to sacrifice or even to jeopardise a tried and profitable partnership for the sake of some private political feud evolved from loose conjecture and a smattering of doctrine are dangerous fools whom serious men of affairs must make it their business to silence.

UNLIMITED LIABILITY AS A NATIONAL ASSET.

BY

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A famous statesman once said that the greatness of a country could be judged not from the size and strength of its armies but from the number and reputation of its banks. Even now the banking machinery of India is far from being adequate for needs of the population. There are, of course, the Presidency and the great Joint Stock Banks ; and new banks of one sort or another are coming into existence almost every day. But these are all concerns which serve the wants of large cities and towns. It is agriculture, as everybody knows, that really supports India. And it is pertinent to ask how far the ordinary banks have succeeded in getting into touch with agricultural interests. To answer that they have scarcely succeeded at all would be no exaggeration. The reasons for their failure in this direction are not hard to find. In the very first place, the Banks admit that (as behoves shrewed business people) they are well aware of their own limitations. They are remote from the cultivator : and proximity is, of course, the first essential of credit. India is, for the most part, a country of small units ; a vast rural area of small villages, small holdings, small dealings, and small incomes. And yet, withal, these same small units make up a huge aggregate. The seed put into Indian fields represents, by itself, a tremendous recurring capital investment ; the necessary cattle and agricultural implements are not to be had for nothing : and the value of the produce of each harvest runs into gigantic figures. The commercial position of an agricultural country which can absorb, without apparent effort,

(as India can) one-fifth of the whole world's annual output of gold is important indeed. Nevertheless it is common knowledge that all is not as it should be with the actual source and fountain head of India's wealth as represented by the humble cultivator. Those who are in a position to observe naked facts know that the Indian peasant is, in truth, suffering from an economic malady of long standing,—an insidious disease but an exceedingly dangerous one which must, in the end, prove fatal unless vigorously and continuously treated. The symptoms are complicated, and if the diagnosis is to be correct attention must first be directed to the causes at the root of the trouble.

It should be evident to all thinking men that it is no more possible to injure one part of the community without injuring the body politic, than it is to injure one portion of the human body without injuring the organism as a whole. The doctrine that the ultimate interests of the several classes in the State are opposed to each other was exploded 2300 years ago. Discontent had fastened on certain classes of the Roman citizens who fancied that their special interests were to be sacrificed to secure the betterment of other classes. Some said "The poor can only become richer by making the rich poorer". Others said "The rich can only become richer by making the poor poorer". To both arguments the great Menenius Agrippa replied in the following fable :—

"In times of old, when every member of the body could think for itself and each had a separate will of its own, they all with one consent resolved to revolt against the belly. They knew no reason, they said, why they should toil from morning till night in its service, while the belly lay at its ease in the midst of all and indolently grew fat upon their labours. Accordingly, they agreed to support it no more. The feet vowed they would carry it no longer ; the hands that they would do no more work ; the teeth that they would not chew a morsel of food even if it were placed between them. Thus resolved, the members for a time showed their spirit and kept their resolution. But

soon they found that, instead of mortifying the belly, they only undid themselves; they languished for a while, and perceived too late that it was owing to the belly that they had strength to work and courage to mutiny !”

The moral which this ancient Roman wished to point is applicable to India. If it is admitted (and a reference to statistics of trade, resources, and population must compel the admission) that the prosperity of India is sustained by her harvests then, clearly, the soil itself represents the national belly. The soil supports the cultivator, the cultivator supports the middleman, the middlemen the grain dealer, and so on. Where would the lawyers be if the agriculturist had no money to spare for litigation? Who would buy from the merchants of the towns if there was no money in the villages? It is an axiom that the richer people are the greater become their wants and aspiration. And if our scheme of Indian social reform is not to level down but to level up, not to take away from those who have in order to distribute in infinitesimal dribblets amongst those who have not, not to provoke class hatred but to induce all to work harmoniously together for the common good, we shall not have to depend our policy from the attacks of wise and prudent men. Social reform, properly understood, means, quite simply, the policy of elevating the moral character and improving the skilled capacity of the people. The real assets of a nation are not its coal mines or its wheat fields but the skill and character of its members. The State, if it is to be alive and vigorous, must be moulded by its individual citizens despite the assertions of confused thinkers that the citizen must be moulded by the State. These are the principles upon which the co-operative movement in India is founded; and the success which co-operators have achieved is already so remarkable that it is worth while reviewing the methods which have been followed.

When Frederick William Raiffeisen devised his system of co-operation he laid great stress on the educative force and value of the acceptance by small groups of borrowers of “un-

limited". It must be remembered that it is the main object of co-operative credit societies, with unlimited liability to create a special form of marketable security. The real purpose in view is to substitute for weak isolated credits one strong combined credit with character and integrity as its main assets. The time for debating as to whether we, in India, can do this has passed and gone. Co-operative societies of this kind exist in thousands, and all who have had experience of their working appreciate their good effects. The District Judge who found recently that his cause list had discredited by no less than 1100 cases in a single year and was not slow to attribute the fact to the influence of the co-operative societies stands as a witness to the reforming power of "unlimited liability". And from all sides comes testimony of a similar kind. We hear of defaulters expelled from caste, of fellow members saving a weak brother from bankruptcy and disgrace, of dishonest borrowers being soundly beaten by their irate but honest associates. I can point to societies of weavers who seemed before they co-operated, to be last to almost every sense of shame. Drunkards and gamblers they formed an easy prey for the petty usurers who exploited them to the full. Under the influence of "unlimited liability" a new sense of responsibility has been roused, and these same men are to be found exercising a mutual supervision over each other's affairs which does not countenance indulgence in any habit which is likely to cause loss to the society. "Unlimited liability" has created a public opinion where none existed before; and those who know and understand the lives of our Indian artisans and cultivators will know that this in itself is an achievement which cannot fail to be far reaching in its consequences. Already these weavers are asking for improved looms and better material. Recently they asked for help to open their own shop; and when it was pointed out to them that a shop could not be supported unless the existing societies were strengthened and fresh societies were formed they (who but a year or so ago were quite without initiative) volunteered to go and obtain recruits themselves. I can point to a society of metal workers composed of men from whom the spirit of indus-

try had been entirely crushed out by usury. They had scarcely come under the influence of "unlimited liability" before they asked for an improved lathe and expressed a desire to advertise. True, we had been able to come to an arrangement with their creditors and to hold out hopes of ultimate solvency ; but it was the feeling of strength in association that really re-kindled ambition which must have remained cold and dead but for the possibilities opened out by the acceptance of "unlimited liability". I can point to rural societies of tenants who were content to sow any seed however poor and to promise to pay any rate of interest however high before they came under the spell of "unlimited liability." Now they demand the best seed available either from Government seed farms or private seed farms ; savings deposits are being made and reserve funds accumulated and rates of interest are no longer matters for indifference. I have purposely referred to cases in which men of poor reputation have mended their ways when given the chance to do so. For my object is to point out that "unlimited liability" has a way of fashioning good stuff out of apparently unpromising material. The better the material, the better the results.

The most aggravated forms of the economic malady have been indicated first. The symptoms are not hard to recognize. Ill cultivated fields, inferior workmanship, squalid homes, apathy and listlessness, and the smell of rank usury contaminating the atmosphere. But there are premonitory symptoms which like those of incipient insanity, do not at once strike the casual observer. A rigid adherence to customary methods simply because they are customary, the hoarding of all savings, extravagant ceremonial expenditure, fondness for litigation, and, last but not least, indifference to the advantages of education (I use the term in its wider sense),—these develop, unless checked, into the advanced stages. All give way it, as the doctors say, we "exhibit" the remedy of "unlimited liability."

The first question I would ask the man who clamours for social reform is this. "What axe have you got to grind?"

Assuming that we are living in the Palace of Truth the answer will probably disclose the fact that our would be reformer is of the "have" and "have not" school. Quite briefly, the reforms he advocates are intended to take rights and property away from others in order to bestow them upon himself (first), and his class (next). The schemes of reformers of this class are elementary, but it must be admitted that founded, as they are, on human nature (which is probably very much the same to-day as in the stone age) they cannot be neglected. Hague conventions and theories of universal peace are admirable. But preparations for offence and defence still remain part of the programmes of Governments while war is not yet a thing out of date. And where the interests of rival countries come into conflict the most efficient country emerges triumphant. The plain fact is that the people of the world are never at peace; for there rages, continuously and unceasingly, a fierce struggle for trade to which there is no finality. It is superfluous to point out that the country which takes least trouble to prepare itself for the struggle must, in the end, sink to a level of unimportance.

If it be admitted that the real assets of a nation are the skill and character of its members it follows that all who desire to take an active part in working for the common good will welcome the avenues for advancement which are opened out by "unlimited liability". They will probably want to know how this potent remedy is to be administered. In the first place, then, if liability is to be unlimited it is essential that it should be extended only to men who have an opportunity judging each other's merits and defects. For this reason co-operative societies with unlimited liability are generally confined to a single village and to neighbours who see each other every day and know all about each other's ways and customs. An infant society formed among such people soon begins to exhibit a public opinion of its own. Should a member be bold enough to cheat his fellows, he soon finds that this new medicine has aroused a contempt for dishonesty which did not perviously exist. He finds, perhaps, that his fellow members watch him closely, but that their

supervision is always for his moral and material benefit. For instance, he wants to purchase bullocks with money borrowed from the society ; the members will not only see that he does buy bullocks, but that the bullocks are good and healthy ones. If he wants to sink a well and takes a loan for the purpose, his fellow members will, depend upon it, see that the well is properly constructed. If he wants to borrow an extravagant sum for marriage expenses his fellow members will refuse to grant him a sum larger than he can afford to spend upon ceremony. " Unlimited liability ", in truth, makes not only for economy but for the creation of capital by ensuring that money is profitably expended. The principle is this. The borrower is to be given time to pay back his loan out of the profits he has secured from it, and he is to be left the better off for the transaction and not with a dead weight of unproductive debt to carry. In most cases, it will be found that borrowing weakens a man's resources because profits are dissipated before loans are repaid. It is one of the main objects of co-operative credit societies to prevent this. Petty disputes which occur between members are, it is found, no longer taken to the Civil Courts for decision but are referred to the arbitration of the society committee or of a general meeting of all the members. And so it comes about that " unlimited liability " makes for thrift and prudence in a number of ways which are not at first apparent to the casual observer. It is remarkable, too, that in villages where there are co-operative societies a genuine desire for education is soon apparent ; for " unlimited liability " brings home, as nothing else can, the pains and penalties which are attached to illiteracy.

It must always be remembered that the co-operative movement in countries where it has attained grand dimensions owed its origin to the fostering zeal of men of superior education and enlightenment who were content to go into the villages themselves and there devote their time to the education of their humble brethren. These workers did not pause to consider what their responsibility to their country was ; but they did their utmost, and did not ponder whether their liability for the

welfare of the people was limited or not. We, in India, to-day stand in urgent need of more unofficial workers in the co-operative movement. They must be men of zeal and of understanding as well. The two must go hand in hand. Provided a sufficient supply of such men is forthcoming (and I, for one, believe that it will be) the prospects of the co-operative movement in India are great indeed. To quote the words of our King Emperor at Delhi "if a sound system of co-operation can be introduced and utilized to the full, a glorious future lies before the agriculture of India". And, it may be added, not only before Indian agriculture but before industrial interests and all classes of the community. Granted, then, that we have a sound system of co-operative credit societies, the next step is to turn the new kind of security which they offer into a negotiable form. The stream of capital has to be brought down again to enliven the source from which it originally came. Co-operative societies borrow money on the strength of their "unlimited liability" and all the attributes which the term implies. They deal with Central or District Banks formed for the express purpose of financing them. These Central Banks include in membership not only the societies themselves but also leading men who have undertaken the work of co-operative education. The Directors of Central Banks include amongst their number landowners, lawyers, merchants, and, in fact, men of almost every trade and profession. They work at first without any paid staff, and honorary organizers bear the burden, assisted by the Register of Co-operative Societies and his small staff. Next, comes the stage at which Central Banks employ their own staff; and then the stage at which the societies themselves take an active controlling part in the affairs of their Central Bank and contribute towards its expenses. Experience has shown that Central Banks, when well managed, are able to attract capital

if not from the open market, at any rate, from a Co-operative Provincial Bank which constitutes the last link between the ordinary financial system and the small society with "unlimited liability". The edifice has been built upon the character of the people; and its growth must depend upon the capacity for self-improvement which co-operators exhibit. The movement, as a whole, is a new one in India; but co-operative capital already runs into crores of rupees and progress has not only been rapid but has been pronounced to be sound by competent judges. Co-operation, in conclusion, is a science which deserves careful study of all who are interested in economic progress. It is a modern weapon which is, at present, in world-wide use. It has been adopted by countries which compete with India in the markets of the world; and it is essential, if India is to keep her place in the race for commerce, that the importance of co-operative interests should not be underestimated.

AGRICULTURAL ASSOCIATIONS IN THE DECCAN.

BY

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Organiser, The Deccan Agricultural Association, Poona.

The utility of Agricultural Associations if properly worked is no longer a subject of dispute. It has been over and over admitted on all sides, that there must exist an organisation, a body, which would serve as a link between the Government Agricultural Department and the cultivating classes, separated as these are by a wide gulf. It is not perhaps too much to say that without the aid of associations it is impossible for the work done by the Agricultural Department to have those wide-spread and beneficial results, which alone can justify its existence. The individual members of these associations being well-known men of their neighbourhood, men of experience in practical every day cultivation, the ordinary cultivator will listen more readily to these than to any other—expert or official. It is necessary however that individual members should work. And where the associations have got these right sort of men, their work has been and is going on well, and is being highly appreciated and followed by the cultivators.

In the Marathi speaking tracts of the Bombay Presidency there are altogether 29 Agricultural Associations. Out of these, 17 are in the 5 districts of the Central Division *viz.*, Poona, Satara, Sholapur, Nasik and Ahmednagar.

I had this year the opportunity as organiser of the Deccan Agricultural Association of visiting these associations situated in these five districts. It will be of interest to know their activities, and the general agricultural improvement these are calculated to effect, and the benefits resulting therefrom to the agricultural public.

In all these 5 districts the Ahmednagar District tops the list in point of the number of Taluka Agricultural Associations it has. This is due to the spirit of organisation that existed in some of the gentlemen who were instrumental in starting that pioneer Agricultural Association in the Deccan, I mean the Sangamner Agricultural Association. This was the first association in the District and the rest followed its example. This is also due to the agricultural shows which used to be held in this district almost every year, both at Ahmednagar and in the Talukas by rotation. These shows created a good deal of awakening in agricultural matters, and the people thus came to know the utility and importance of agricultural associations. In some of the Talukas committees of intelligent, and well-to-do cultivators and land-holders were formed to represent their Taluka at the District shows, and to give their own experiences of any new crop tried, the advantages from any field improvements effected *e. g.* of Tals put up or the use of jumperbar for deepening wells. These organisations afterwards developed into agricultural associations. In others these were formed through the zeal and interest in agricultural matters on the part of local men.

At some places these associations were started at the instance of the central association, which created a good deal of interest in agricultural matters by meetings and other ways among the local men. In certain other places besides the objects of the improvement of agriculture, the organisation was formed for the co-operative sale of farm produce.

In the Satara District, in addition to the regularly formed Agricultural Associations, which are in two Talukas only, in rest of them the District Revenue authorities have *nominated* certain intelligent cultivators from each Taluka and they are often brought together for giving information on agricultural matters, and to this organisation the name "Agricultural Associations" has been given.

From the foregoing it will be seen that under whatever circumstances, these associations might have been started, their main object consists in the improvement of agriculture. The work of these associations until recently was limited to obtaining good seed for distribution amongst its members from the Agricultural Department or through it or the organising of an Agricultural Show in the Taluka.

Before dilating upon the practical work these associations are doing it will not be out of place to give a few words about The Deccan Agricultural Association, its relation to these smaller associations, the help it is rendering to these in maintaining their activities and the work it is accomplishing in spreading the knowledge of improved methods to the doors of the cultivators.

This Deccan Agricultural Association or the Central Body at Poona with its representative membership, and the strong co-operation of the experts and officials of the Agricultural Department forms a very influential and useful body in the cause of agricultural improvement. It disseminates agricultural knowledge, through papers read at its quarterly meetings, by means of its rural meetings held at places away from Poona and by its close touch with the local associations. It publishes an illustrated magazine—*The shetki and shethkari*, which goes a long way in furnishing a long felt want, of an agricultural publication of its kind in Marathi, quite fitted to be a friend and companion of every cultivator who can read and write. Furnished with such useful material The Deccan Agricultural Association forms the Central Body for the benefit of the general agricultural public and a stimulating agency for the smaller associations.

Work done by the smaller associations:—A number of subjects which have been proved to be useful by the Agricultural Department, and which can be safely recommended to the cultivators, and are suitable to the particular locality where the Agricultural Association exists are brought before the Agricul-

tural Associations. The utility of these and the benefits that will be derived from them are then discussed in a meeting of the Association, and the cultivators, gathered after carefully considering if these new methods are profitable to them, undertake to carry out these on their own farms. Some of the subjects suggested are such as can be followed by any ordinary cultivator, without any cost to him and which are within his easy reach. Some which require initial expenditure are taken up by him after having been followed by his more well-to-do and substantial neighbours. Thus at each of the Associations one or more of the individual members follow one or the other of the improvements suggested. These serve as demonstrations to these cultivators of his neighbourhoods who are more sceptical to take to these of their own accord, without seeing them actually done or practised, and proved of decided advantage.

Some of the very useful and simple improvements are : (1) The proper preservation of cattle manure, (2) The selection of seed, (3) The use of copper sulphate against smut, (4) The cultivation of early maturing and profitable foreign varieties of groundnuts, (5) Cultivation of good yielding varieties of cotton, and wheat, (6) Green manuring with San (Tag) for paddy.

The proper preservation of cattle manure and especially urine, which though manurially highly useful is entirely lost sight of in some places. It is not uncommon to find cattle dung carelessly heaped on the ground. In this condition the dung gets dried and loses most of its manurial value. In this connection the storing of dung in a pit and frequently keeping it wet by allowing waste water to drain into it, and the absorption of urine in dry earth by spreading the same on the byre floor and thus preserving the most valuable manurial ingredient, can be followed without any extra cost. Both these are very simple methods and do not require any great outlay in money but what is required is more work on the part of the cultivators.

Another simple thing within the means of every cultivator and to which no proper attention is given in some places is the

selection of seed while the crop is standing in the field. The importance of seed-selection cannot be overrated. There have come out good results from the selected seed as compared with the unselected seed. There is a possibility of developing particular strains of seed such as early ripening, draught resistant and so on, by following the principle of seed selection every year. In these days of scarcity of rainfall we want early maturing and draught resistant varieties. During my recent tour in the Ahmednagar District, the importance of seed selection with these objects in view was demonstrated on the standing Bajri crop, and some of the intelligent cultivators in the Sangamner Taluka have promised to follow the same. This thing like the above does not require any cost, but labour and the desire to do things on the part of the cultivator are the only essentials.

The third thing is the use of copper sulphate as a preventive against smut (Kani or Kajali). In some places smut does such an amount of damage that a cultivator loses sometimes $\frac{1}{4}$ th of his crop. By spending one anna per acre on copper sulphate for seed-steeping the loss resulting from the disease can be totally prevented.

By the cultivation of the early maturing varieties of foreign groundnuts, and good yielding varieties of cotton and wheat, instead of the usual varieties of these crops which the cultivator grows, his income per acre is materially increased.

Other useful subjects and improvements, but which require some investment on the part of the cultivator are—(1) The use of the iron plough, (2) The use of iron sugarcane crushing mill, (3) The use of Poona Furnace for preparing gul, (4) The use of artificial manures as top dressing for sugarcane.

The iron plough costs Rs. 39. The utility of this implement has been now proved beyond doubt. The difficulty of its repairs, and the replacing of parts is no more now a difficult thing. These ploughs are also being manufactured here by Messrs. Kirloskar Brothers in their foundry at Kundal Road

Station (S. M. Railway). In short all the things mentioned above can be followed by any cultivator and it has been found that even with the little initial cost, it always pays him in the end to do so.

Besides the knowledge of the improved methods these associations are given information on co-operation in buying and selling, the vernacular agricultural schools, where agricultural education is given to the cultivator's sons. In this way the smaller associations are stimulated to work and some of these are doing very good work. It won't be out of place to give an idea of the chief lines of work undertaken by some of the associations.

In the Satara District the Islampur Association demonstrated the use of Poona Furnace for making gul, which has proved to be more profitable than the local one. It has this year applied Ammonium sulphate as top-dressing for sugarcane in one of the cultivator's field to show its effect side by side with the ordinary treated plot, for demonstrating the use of top-dressing for sugarcane. It has engaged a man who goes round and shows the steeping of jowar, and the working of the iron plough. Besides this its individual members carry out one or more of the improvements mentioned above.

The Satara District Agricultural Association is going to start during the Kharif harvest season 2 seed stores for supplying pure seed of the staple crop to the cultivators, while the individual members are following the improvements suitable to them.

The Sangamner Association in the Ahmednagar District is popularising Iron-mots, iron-ploughs, foreign varieties of groundnuts. Its individual members have taken to the use to top-dressing for sugarcane, the cultivation of foreign groundnuts, selection of seed, the levelling and bunding of fields to prevent washing and so on.

The Jamkhed Taluka Association has maintained two grain-stores.

The Barsi Agricultural Association in the Sholapur District has maintained a small demonstration plot for demonstrating the methods of dry farming, which latter is the chief kind of farming in the District to which this Taluka Association belongs.

The Sholapur Agricultural Association has purchased some iron ploughs and is popularising them by their free use to the cultivators.

The growing of profitable new crops, and the use of iron plough, and its introduction among the cultivators has been undertaken by almost all the associations.

A few individual members from each of the associations, have undertaken one or more of the improvements mentioned above, which serve as so many demonstrations of improved methods to the neighbouring cultivators.

Some of the associations are only of very recent growth and consequently have not been able to collect sufficient funds, to carry on certain demonstrations independently like the Islampur or Sangamner Associations.

From the above it will be seen that in most cases the efforts of the associations, and their individual members are joined together to push on the agricultural improvements amongst the cultivating classes. Where the associations have no sufficient funds to hold such public demonstrations, the work of the individual members with slight help from the association in obtaining good seed for them is also doing a good deal in introducing new things.

On the whole it seems that cultivators are much benefited by such local institutions owing to the general awakening of interest in agricultural matters, and the idea so long held by them that nothing new is possible in agriculture is gradually passing away from their minds, and their views are getting more liberal to adopt new things.

The above has been observed even in small villages.

For the proper working of an association three things are essential—(1) right sort of men, (2) funds, (3) desire to work.

As regards the first point, well-to-do men, who have got lands and who work them themselves are required; such men can carry on on their own fields the improvements advocated to them. These when actually seen by the others are taken up by them.

Secondly, unless the association has some money its work will not go on properly. As, sometimes before a certain thing (which is intended to be followed by its members) is actually demonstrated and its utility explained, it will not be taken up even by a well-to-do cultivator. To do this therefore, as well as to purchase an implement of proved value for its introduction funds are required.

Thirdly, desire on the part of the members to do something individually apart from the demonstrations by the Associations as a body, is necessary. Unless these three things exist very little progress will be done. And wherever the work of the association is going on satisfactorily, it has been observed that these things are always to be found.

PRESERVATION OF NATIONAL ART, HANDICRAFT AND CHARACTER.

BY

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Kolhapur.

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I should offer my hearty thanks to the Conference for allowing me to express my humble views on the above subject.

From time immemorial, art has been the expression of the human, nay, the divine intelligence for the happiness and pleasure of the humanity. As human mind is the fountain of diversity of thought, so it will never be content in having its skill expressed in a particular direction only. As India had gone to the climax of its civilisation in art and spiritual thought, it has still left, in the minds of the Indian people, the traces of the high appreciation of sculpture, art and painting.

Unfortunately, the old Indian art is dying out and the people are getting into modern modes of life and tastes. As this condition is not favourable to the development of indigenous art, it is deplorable and should be corrected as early as possible.

Complete happiness is not gained merely by wealth and commerce ; on the contrary, the ambition of being a millionaire at the expense of the money and labour of others, is very dangerous. Several disastrous and unhappy examples of it have been observed in Europe and America.

There is a cry for industry in India, and several European and American manufacturers will soon install their machineries to carry out all the works and put the products in the market very cheap. I am not, in the least, against the growth and development of such industries in India. They are essentially required.

Surely, a steel machine can turn out in a short time, a large quantity of material for sale and satisfy the needs of merchants. But, will it develop intelligence and relieve the wants of the labouring classes? No. The repeated strikes of the labourers in Europe and America definitely point to the fact that machine industry does not remove the wants of the poorer classes. Comparatively, India being a poorer country its agricultural class will suffer heavily if the machine-industry be introduced in every direction.

A common excuse is always urged that the products of handicraft prove to be dearer as compared with those produced by machinery. But this is purely imaginary. If the handicraft be encouraged on a large scale and if the products be turned out of various patterns and colours expressive of the highest human intelligence, they will be sold out earlier; because, people have a natural fancy for diversity. A machine cannot at once stamp various patterns at will; it will take some months for a person to design a new pattern and to import it to India, while a person can turn out hundreds of patterns by handicraft meanwhile.

Madam A. L. Pogosky, a Russian lady, has proved the truth of this in a town, 'Zemstvo' by encouraging cottage industries of vegetable dyes, paintings, weaving, embroidery, cookery, etc. A huge literature of handicraft and its success can be received from her on application. I was fortunate enough to see her work in England last year and was greatly amazed at her enterprise and success.

The secret of the success of handicraft is the harmonious co-operation of the wealthy people and the workers. People have no faith in the success of it; but, if they were to put their full confidence and energy in it they will surely succeed. Even, with all the refined skill in machinery, we cannot get yet linen equal to that of Dacca prepared by hand work in ancient time. It is pity to lose such a handicraft!! Again, an artisan working with his hands has an opportunity to express his intelligence in various ways; in embroidery, sculpture, paintings, etc. Will

it be beneficial to the humanity and to any particular country to neglect its handicrafts ? Can a person develop his intuition, by moving the hands of the wheels of a machine for ever ?

Certainly not. Therefore, if the faculty of intelligence, reason, intuition, etc., of the Indian labourers is to be cultivated handicrafts should be fully encouraged. It is not a new thing to them. Millions of people in India have been earning their livelihood thereby for generations and they should be fully encouraged. Thus, instead of the cry for industry, there should be a cry to help the workers and encourage the handicraft.

The virtues of honesty, contentment, altruism, etc., are also necessary to be developed in a person to get full worldly happiness. As these virtues can be gained only through the practice of devotion, religious education becomes necessary for the prosperity of commerce. Looking to the growth of insanity and suicides amongst the merchants of the Western countries, it can be safely said that they are due to lack of interest in religion and to the excess of materialism and selfishness. Also looking to the failures of a number of Banks, insurance companies and industries in India, owing to dishonest and fraudulent practices of company promoters and showed by Indian merchants one can say without hesitation that the Indians have lost to some extent their traditional reputation for integrity. If India is going to have the rapid development of handicraft and mechanical industries, she should be cautious of the above drawbacks and strengthen her traditional spiritual character to make commerce and industry a success.

India being a land of diversity of creeds and colour it is a difficult problem as to which religious system should be introduced into the schools ; but, looking to the sublime philosophy and ethics of the *Vedanta* which are common to all

religions in the world it can be safely introduced in Indian schools for the benefit of the country.

Shri Shankaracharya of the Karvir Peetha has formulated a scheme for introducing it in the masses in its simplest and intelligible form. So any person who is desirous to get full information on the subject can obtain it from the Sarvadhikari of the Kolhapur Matha.

In conclusion, I would urge that, along with the growth of mechanical industry in India, there should be also full development of the handicraft and ancient art; and also a firm establishment of the ancient Vedic religion. I hope these suggestions will meet with the approval of this learned congregation.

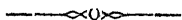
THE INDUSTRIAL EXHIBITION AND SALE OF WORK OF THE SALVA- TION ARMY IN BOMBAY.

A PLEA FOR COTTAGE INDUSTRIES.

BY

TRIMBAK RAMCHANDRA KOTVAL Esq., B. A., LL. B.,

Subordinate Judge, Poona.



The report of the opening ceremony by the Hon'ble Sir Richard Lamb has appeared in the *Times of India* on the 4th October 1912. The principal objects of interest were the exhibits of the silk and weaving industries.

2. Persons from the criminal tribes could be seen on the two days of the Exhibition, going through all the processes of making silk in all its stages. The first was tending the silk-worms fed on the Mulberry leaves, and tending the worms fed on the castor plants. Some of these worms were making cocoons. The second stage was the reeling of the Mulberry silk on the Zanana Reeling Machine, costing Rs. 30 or on a frame containing several of these, in a line, and turned by the handpower of a boy, when several boys sitting in a row each one could reel from his basin. The cocoons used were of the Univoltine breed reared from the seed from France. The machine can be had from the Manager of the Sir Louis Dane Weaving School. The cocoons were put in tins of hot water and placed over a stove and left to boil, to remove the gummy substance. The water was thrown away and new boiling water was taken in an enamel pot and in which were placed enough cocoons, soaked in the tin of the boiling water. A boy then with a bundle of grass kneaded the cocoons and removed the floss on them with his hand, which is called waste silk, and which is exported to Europe and there spun into thread or mixed with Eri-Silk and waste of Tussar Silk.

After this each boy caught about 6 threads from 6 cocoons and put them through a needle hole and guided them on so as to be reeled and wound up by the Zanana Reeling Machine. The cocoons could be seen dancing in the basin. When a cocoon was all unwound the boy supplied a fresh one. Several other processes of preparing the thread for wharf and whoof were being gone through and lastly one could see a native Christian boy weaving a thread into a fabric, on a loom, a patent of the Salvation Army Officer.

3. For the information of the visitors leaflets and pamphlets were distributed giving an idea of the exhibits and the industries represented.

(i) An illustrated paper on the Silk-Worm rearing at the Tata Farm at Bangalore was distributed, reprinted from the *Illustrated Times Weekly* of 30th August 1911. This shows that the Tata Farm was taken by the Salvation Army in their charge in 1910. The Mysore Government continued their annual subsidy of Rs. 3,000. Any one desiring to read an account of the Tata Sericulture Farm at Bangalore and all about sericulture in a nutshell cannot do better than read an article in the *Agricultural Journal of India*, Vol. IV, Part I, 1909, by J. Molison, M. R. A. C., Inspector-General of Agriculture in India. He says "The Farm was started in 1898 to help native rears, to control such diseases as affect silk-worms in India, and generally to give technical instructions in growing suitable kinds of Mulberries, in rearing silk-worm, in reeling and preparing it for market. *The little Farm has answered these purposes admirably.*" A month's course was thought enough.

(ii) In the pamphlet "What the Salvation Army is doing in India and Ceylon" in the chapter on Cottage Industries the principal exhibits of the Exhibition will be found referred to. About silk it says "We have concentrated our attention especially on two varieties of the silk-worm, the ordinary Mulberry-Silk-worm and the other the Eri-variety which feeds on the castor plant; while the work is in its initial stages we have

already met with considerable success. There are already 5- Silk-Farms. Great interest has been aroused in the question and it seems only to be a question of time establishing a great movement along the above lines.

(iii) Another important pamphlet distributed was "The report on experiments by the Salvation Army with French, Italian, Mysore and Eri-Silk, Worms 1911-12". Any one interested in the future of the silk industry cannot neglect or ignore this report. It is hopeful in tone, critical of the past work and the methods of the past workers in the field, a faithful record of what is being done, and full of suggestions for future work. Acclimatisation of the Polyvoltine variety is recommended for the plains and the tropical portions in India, as is being done in Mysore and Bangalore, though the Univoltine variety has been very successfully adopted in Cashmir at great cost, with seed from France.

(iv) A chart illustrating the life history of the silk-worm with notes of explanation was hung by the side of the table showing various samples of the silk thread of the Muga, Tussar, Eri and Mulberry worm reeled or spun in India and in Europe. Good samples of silk produced and reeled at Indore under instructions of the Salvation Army were kept on the table.

4. Mr. Mukerji has investigated the question and reported on it for the Baroda State.

5. Eri-Silk is carded in Europe. It is spun in the Fajul-poor Settlement of the Salvation Army. They do not use the Pusa Machine but prefer an English Spinning Wheel. Imitations of this made by the Salvation Army can be purchased for Rs. 25 called "The Sir Louis Dane Spinning Wheel, from the Manager, Sir Louis Dane Weaving School, Ludhiana, Punjab". A boy can turn 3 to 5 tolas on it in a day. Ready thread can be had at Rs. 4-8-0 to Rs. 6-0-0 per lb. Any one who has seen Mukerji's Monograph on silk can see a variety of samples of cloth made of Eri and other silks. Mr. Commissioner Tucker

Booth can purchase any quantity of Eri-silk-cocoons for English Firms at one to two rupees per lb. This rate is much more liberal than the one of As. 8 offered by the Economic Botanist Ganesh Khind Gardens. This rate at any event creates some market for the Eri-Silk-Cocoons and the Depressed Class Mission can take advantage of it, as also the poor agriculturist who can get castor leaves or Tapioca leaves or of Pandhra Chafa. Tapioca was tried with success, in Ganesh Khind, after rearing the worms in the 1st or 2nd moulting on the castor leaves. I have once reared Eri-Silk-Worms on Chafa with good results at Talegaon Dhamdhera. I have also reared Deo Muga in my hall as a recreation on the leaves of the Banian tree at Sasvad. Live cocoons or seed for these can be had from the Agricultural Director, Assam, Shillong. They are fed on Laural leaves. Dyed samples of the silk were exhibited. About the Eri-Silk-Worm the pamphlet remarks " This is indigenous Polyvoltine variety of a hardy character. It is almost entirely immune from disease. The silk lacks brilliance and cannot be reeled. Hence it does not equal in value the mulberry-silk but it possesses extraordinary strength and durability and the fact that the worm feeds on the castor plant makes it easy to introduce it rapidly and universally throughout India. This worm seems certain to take the place of the Tussar."

6. I quote the following remarks showing the optimistic view about silk industry as a Pan-Indian one with great future possibilities. " If success is to be secured in obtaining for India a front rank position among the silk producing countries of the world, a bolder and more generous policy should be pursued instead of leaving to private initiative, the heavy initial and unremunerative expenditures which are absolutely essential for the ultimate success of the enterprise. It is probable that the Cashmir Government have spent more in one year on their industry than all the other Indian Local and State Governments put together have spent in a decade. And yet here at India's very gates is an industry which would increase her natural wealth and protect her immense village population from the con-

sequences of drought and famine perhaps as effectively as her vast irrigation works and this at an infinitely smaller cost." The opinion of Mr. Commissioner F. Tucker Booth is entitled to weight as he has taken the advice of European experts before he formed his opinion and expressed it in the report.

About the Eri-Silk he says "We were informed by the experts that there would be a limitless demand for the cocoons at remunerative rates. Unlike the Mulberry cocoons which must be packed loosely for transportation, the Eri-cocoon can be packed closely like cotton, an important consideration. Being spun and not reeled the facilities for spinning it in a marketable form are at present greater in Europe than in India and there seems good reasons for believing that the large export trade may in process of time spring up". As the silk industry occupied a prominent position in the Exhibition, and as my conversation with Mr. Commissioner Tucker Booth and his wife on the subject made a deep impression on me, I cannot help quoting the recommendations and suggestions he makes in chapter VII of the pamphlet. They are:—

(i) A definite policy should be decided upon and resolutely pursued.

(ii) In mountain regions where the winters are severe and in districts where only tree-mulberry is available, it will be best to concentrate attention for the present on the Univoltine French variety importing fresh seed from France annually on the system so successfully established by Sir Thomas Wardle in Cashmir.

But even here arrangements should be made for introducing bush-mulberry with a view to raising several crops. This can be done in two ways:—

(a) By keeping a portion of the imported seed in cold storage till the time comes for its release, as has been successfully done in Japan.

(b) By introducing healthy, disease free seed of Mysore or Bengal Polyvoltine variety.

(iii) In tropical regions the Polyvoltine indigenous worms should be given the preference, provided that Bush-Mulberry is available, or that previous arrangements are made for its introduction.

Bush-Mulberry planted at the Allahabad Exhibition in November was ready for use in January and February, whereas trees are not available for 3 or 4 years.

In regard to Mulberries the introduction of Bush-Mulberry need not exclude that of trees. The latter need little care, can be grown with or alongside the ordinary crops, and require no expense for cultivation, while supplementing the bush supply, and yielding a crop of leaves at the most important season. The Bush-Mulberry will need protection from cattle and goats like ordinary field crops.

The training of an adequate and experienced staff of experts is one of the most urgent requisites. It is the recognition of this that has led us to establish the Silk-Farms above referred to and in these and similar institutions it should be possible to quickly give the rough and ready practical training which is required.

It is not so much highly trained experts with superior qualifications that are required, (though a certain portion of such will be needed as leaders) as the practical training and improvement of the men who are actually engaged in the business, and who will look to it for the support of their families. To encourage such, seeing that they are invariably family men, it will be necessary to offer scholarships or salaries while they are in training. Each district interested in the business should send some men to be thus trained, meeting the necessary expenses.

Where instruction is only desired in silk-worm rearing and in the cultivation of Mulberry a brief period of training will suffice. Where reeling is to be included a considerably longer period will be required.

Improvement of seed and protection from disease: In Bengal seed stations have been successfully established and microscopes distributed, and this at a very small outlay on the part of the Government. Silk-worm rearers quickly learn the great advantage of having disease free seed since they are able to raise a much larger percentage of their crop and consequently obtain a much higher price for it.

Next to Cashmir the Bengal Government is the most advanced and liberal in its support of the industry, expending, I believe, Rs. 40,000 annually in doing for the rearers what they are obviously quite unable to do for themselves.

The duty of Government in this matter is clearly recognised in all countries where silk-worm cultivation is successfully carried on.

It cannot be too clearly insisted upon and recognised that the silk-worm industry will never be either self-created or self-existent. The *laissez faire* policy cannot, and never has succeeded in this domain.

Private enterprise should be freely subsidised and encouraged, where it exists, and where it does not, it will be the obvious duty of the Local and Supreme Governments to inaugurate a definite policy and to follow it up with an adequate expenditure of money, which will be abundantly recouped at no distant date.

In China, which still leads the world, the industry was inaugurated by one of her early Empresses, who is to this day venerated as one of the chief benefactresses of her race.

In Japan, which closely follows her lead, no public expenditure is spared which can conduce to the improvement and

progress of what has now become one of her leading sources of national wealth and employment. As an illustration the Japanese have just bought a million cocoons from Manchuria, and are advertising for 1,500 Chinese experts, to start sericulture in Korea.

In Europe the cult was introduced in spite of climate and other obstacles by Kings and Emperors, with a lavish and yet none too lavish expenditure of money.

If India is to take a leading place, as she easily may instead of following as at present at the tail end of the procession, a vigorous policy must be inaugurated and sustained, and an adequate expenditure cheerfully made, and private enterprise duly supported and encouraged.

7. I made the Eri-Silk thread spun on the Pusa Machine into fine socks ; neckties, sashes and sundry other articles can I believe be made. The socks were made for me by the ladies of the Seva Sadan, Poona and my thanks are due to MRS. RAMABAI RANADE. The Knitting Machines should be used to utilise the thread. Fishing thread and thread for leather work can be made with great advantage. I suggest these as large quantities of cocoons enough for export cannot be collected except on co-operative lines. A visit to the exhibition and conversation with Mr. Commissioner Tucker Booth and the perusal of the literature would make anyone hopeful about establishing Eri-Silk industry, as a cottage industry, it may not make one a merchant Prince but will add butter or salt or both to the bread earned from other sources. It is suited even for the very poor. I have done it on small and large scale. The Bombay Agricultural Department has issued a Bulletin on the subject. The Pusa Imperial Institute has also issued one No. 29 of 1912 and Mr. Lefroy's article in the Agricultural Journal of India Vol. IV, No. 1 on the subject is enough to teach the theory and practice of rearing Eri-Silk worms. The reader may refer to Agricultural Ledger No. 19 of 1894 and Notes on Industries of Assam by E. Stack, Esq. C. S.

8. The writer in the *Times* says the eyes of many people in Bombay must have been opened by the Exhibition to the value of the Army's Indian work. I have written the above so that the Army's good work, recommendations and suggestions may be known far and wide and may serve as a leaven for the far larger mass outside Bombay.

9. Mr. Commissioner Tucker Booth has strongly advocated State aid to start Silk-Industry for the betterment of the lower strata of society, for whose uplifting he was devoting his whole-hearted labours.

10. Mr. Commissioner fully realised that Government's support is a valuable asset. The Hon'ble Sir Richard Lamb says "The Salvation Army is doing admirable work in fostering what may be called HOME INDUSTRIES :—That is in showing the humble and the lowly how by labour, of which, they are capable, such as weaving, silk raising—they can raise themselves in the world, raise themselves, that is, to a condition as Mr. Commissioner Tucker Booth well put it, of well being and reasonable earthly comfort, and at the same time attain a state of physical and moral fitness and the possession of the spirit of contentment". The Exhibition thus teaches the grand moral of giving ones best for the services of his country and striving for the social regeneration of the society, irrespective of the class, creed, caste or colour.

11. "To discover channels of remunerative labour is by no means easy and it is wonderful how imitative and lacking in initiative are for the most part of our Indian brethren. It is not only in the matter of home industries but also in the great concerns. To develop new openings for the small industries, those on which the lowly and humble can work and earn for themselves health, wealth and happiness as defined by Mr. Commissioner Tucker Booth, this also needs a large amount of preliminary spadé work, investigation, thought, money and initiative. Some of this Government endeavour to supply, by making surveys of small industries but the efforts of Government need

to be supplemented by non-official labours. And we welcome the earnest and thorough-going labours of the Salvation Army in the field." This is an important remark by the Hon'ble Sir Richard Lamb which deserves to be considered.

12. I told Mr. Commissioner Tucker Booth what efforts were made in the past and were being made at present in the matter of sericulture in the Poona District and the Presidency and asked him if we in the Poona District could go in for sericulture as a cottage industry and his answer was in the affirmative. The conditions of success he said were enterprise, proper expert skill and sufficient funds and whole-hearted persevering efforts with a sufficiently trained class of workers. The Punjab Government has issued a Bulletin on sericulture.

13. Next to the silk industry, the weaving industry occupied a large space of the Town Hall. Special weaving looms of the Army's own pattern were kept working. Turkish towels were being turned out in one loom. Improved processes of wharf and whoof were being shown. About weaving 2 booklets were given to a visitor (i) "The Sir Louis Dane Weaving School for the Punjab, Ludhiana" and (ii) "How to start a self-supporting weavery". These give information as to the work that is being done by the Army among weavers. Managers of Institutions, Schools, Hotels and Clubs are requested to help the Army by placing their orders with them. A similar remark was heard at the Fancy Bazar of the Poona Seva Sadana on behalf of that benevolent institution. I could hear it said that now that students, clerks and gentlemen wear socks and stockings, they can purchase such articles from institution like the Seva Sadana and help the cause of charity.

14. On one table one saw several plants of Eucalyptus and a pot of thornless Cactus. There were exhibits of lace, drawn thread and needle work. Cassava (Tapioca) plant or its products were not kept in the Hall as it could not be arranged. The plans and models of the buildings of the Army also attracted one's attention. The British and Foreign Bible Society had a

stall there containing the Bible in 50 different languages. There was also a plentiful supply of literature, dealing with the work of the Salvation Army, for sale.

15. A leaflet on "How to plant Eucalyptus" was distributed. A Bulletin on the subject is published by the Pusa Institute No. 23 of 1911. Plants can be had from Sharanpur. Any one desiring to plant these malaria fighting trees should state the condition of the climate of his locality and the Superintendent, Government Gardens, Lahore can recommend to him the particular kind of tree suitable to the climate and locality. There are Eucalyptus trees in the Ganesh Khind Gardens.

16. Cuttings of thornless Cactus for planting, which serves as a food for cattle can be had from Salvation Army, Danapur Settlement Jail Road, Lahore. They are sold there. A Bulletin as to how to use it, is issued by the Bombay Agricultural Department. On this subject may usefully be read an article in the Indian Trade Journal, Vol. VIII, page 21, Cactus as a fodder crop.

17. Lace making is carried on at Satara just as sericulture is introduced at Ahmednagar in the Bombay Presidency. Instructions on lace making can be had from Satara. A Salvation Army lady would probably be deputed to any place to teach lace making if so desired.

18. Casava (Tapioca) was not kept in the Exhibition but Mr. Commissioner Tucker Booth asked me to push it on to the notice of the public as a great fighter of famine and a drought resisting plant. I can recommend a perusal of the Government Resolution issued in 1908 by our Government, Agricultural Ledgers Nos. 4, 15 and 10 of 1897, 1900 and 1904 respectively; an article in the Agricultural Journal of India on the Subject in 1908 and the American Farmer's Bulletin No. 167 of 1903. The Ledger of 1904 gives nearly all the information that one requires. I have planted trees at Dapuri and they have grown well. Cuttings for planting were obtained from the Ganesh

Khind Gardens. They can also be had from Yisudasen Salvation Army Mavelikarai, North Travancore. The roots furnish a good cheap food. Information on the subject in vernaculars must be made available to the Public.

19. Poultry and Fruit Farm exhibits were not shown, however; Australian fruits and jams attracted attention on entrance to the Hall. The proceeds of sale profits were to go to the Funds of the Army. The Pusa Institute has issued two Bulletins Nos. 4 and 16 by A. Howard on the Fruit Experiments at Pusa. On canning vegetables, fruit and meat at home American Farmer's Bulletin No. 359 gives practical hints to an Amateur. The Government of Eastern Bengal and Assam has issued a Bulletin No. 22 about the poultry industry in that province. The general remarks are useful to our province also.

20. There was a stall exhibiting the work of boys and girls in the schools of the Army. There were books on the educational systems of the present day. One book called the School Gardens attracted my special attention. An excellent article on this subject has appeared in the Agricultural Journal of India, Vol. V, Part III of 1910 by Mr. M. E. Couchman, Director of Agriculture, Madras. School Gardens in our Presidency are prominent by their absence. There were stalls for the sale of cotton and silk goods. A variety of fancy articles were exhibited the profits of sale of which were to go to the Army Funds. The Army finds market for the goods of the poor worker. To the above list of cottage industries may be added the artificial cultivation of Lac on Babul, Palas, Pimple, Vad, Tur, Bor, Shitapbal and Kusumb. Bulletin No. 28 issued in 1912 by the Pusa Institute will serve as a good guide but I may as well tell the reader that the Babul tree can be inoculated with Bor mother-lac. I have done it successfully in the Poona District. My results have been published. The Bulletin on page 26 recommends Babul brood-lac for Babul trees. I have done this also with success. My paper on Lac Cultivation has been published by the Industrial Conference last year. In the Commercial Guide to the Forest Economic

Products of India, Lac is mentioned as an animal product of importance and pages 152 and 153 should be read by every one interested in the Lac industry. Very useful information about the Babul tree is given on pages 11, 12 of the above book. It will show what a vast field there is for increasing the Lac industry. Mr. Stebbing's Monograph on Lac insects, Sir George Watt's Lac and Lac Industries, Puransingh's note on the Manufacture of Lac and Chemistry of Lac, as also the several articles in the Trade Journal may usefully be read for an advanced study of the subject.

21. I would further add to the list the cultivation of the Shingada nut (*Trapa bispinosa*) and Annatto. For information on these one may refer to the Agricultural Journal of India, Vol. IV.

22. The persons in charge of the several stalls answered every question of the Visitor very cheerfully. Philanthropy, Charity and Education seemed to pervade the Hall and by natural process the aims of the Salvation Army got engraved on every heart, and they could be read thus :—

“The Salvation Army seeks to supply the missing link between want and wickedness and health, wealth and happiness. When we say health, we mean physical and moral and spiritual fitness. When we say wealth, we mean not a superfluity of riches, but the well-being and reasonable earthly comforts of its possessor ; and when we say happiness, we mean that spirit of contentment which flows from a mind at peace with God and man. We seek to be a Church to the Churchless, a home to the homeless and a refuge to the destitute and needy, regardless of class, caste, colour or creed. We strive to do for the poor what they cannot do for themselves and to protect them in the enjoyment of the fruits of their labour.”

23. The purpose of this paper will be served if the description given here of the Exhibition creates the effect in stimulating the active interest of all well wishers of India in what is being done by the Salvation Army in discovering channels for remunerative labour, by way of cottage industries for the social regeneration of the lower strata of the society to supplement the efforts of Government in that direction.

HOW TO DEVELOPE GLASS MAKING AS A COTTAGE INDUSTRY.

BY

Lala Panna Lall,

Proprietor, The Upper India Glass Works, Ambala City.



1.—There is a popular belief that in industries which have developed into factory systems, wherein the agency of production is transferred from Human labour to that of Machinery and steel, involving a minute division of work and specialisation of every individual detail, and to the establishment of huge factories where the forces of capital, intellect and labour, are concentrated and intensified, it has become well nigh impossible for the old methods of home (cottage) industries to flourish. The gradual decline of the hand-weaving industry in India is instanced as a standing testimony of the correctness of this theory, and it is predicted that in spite of the strenuous efforts which Government and private agencies are making to revive the hand industry, the latter is bound in time to disappear and give place to the modern power-driven complicated system of Mills. There may be a great deal of truth in what the advocates of factory system say about the alternate reduction of cost-factor, and of the increase of production,—resulting from the replacement of mere hand-work by modern machinery in respect of many a branch of industry.

2.—But I have been keenly watching the effects of introduction of the newer methods of work by the aid of machinery in the glass-making industry, and it appears to me that whether in Bohemia and Belgium, which are two important centres of glass-making industry, in Europe, or in Japan which has lately risen in importance as one of the cheapest market in the world, for purchase of common articles of every day use, the

and workers and cottage industrialists are successfully holding their own and their trade is gaining in popularity and in demand. It may be that the advent of machinery has been later in this branch of industry than in others and the appliances of steam and steel are still in a stage of experimentation. It may be that in the whirligig of time, a day may come, when the cottage worker would find his crust of bread snatched away by capital and labour concentrated in some factory near by, but the fact remains that cottage glass industry is still in a flourishing condition, and can not be classed among the dying industries.

3.—Glass-making has been tried on the factory system in India, but the results have not yet been satisfactory. It may be that in working new industries on an extensive scale, a great amount of intelligent and able guidance is required and none of the factories working in this country, have been able to secure that. But our failures would not have been in vain, if we learn some lesson from them and begin a new from the point where the Westerners commenced and succeeded. Why not let us commence from small beginnings an experiment glass manufacture on the lines of a cottage industry. No individual person however, would care to launch on such a scheme, and we need the assistance of a well organised public body to pilot the scheme to success in the beginning. The Government, or some enlightened and go-ahead Indian Prince, would, if they lend a helping hand, make this promising young industry a brilliant success. The requirements are small, but there would grow up a large net-work of suppliers of material, glass-makers, retailers etc., which can be efficiently controlled through State agency.

4.—For starting and working a cottage factory, we require—

(1) (a) A Smelting Furnace.

(b) Crucibles.

Smelting furnaces are made from fire-bricks set in fire-clay mortar. The construction of common furnaces is not difficult,

though until a scientific knowledge of the principles of heat and combustion grows up, the furnaces are likely to remain wasteful in fuel consumption. But fuel is cheap in India and this waste has to be faced until the prevailing ignorance is removed. Crucibles are made from a mixture of raw and burnt fire-clay. Fire-clay deposits of Jubbulpore are tolerably good.

Fire-clays exist near Delhi, but their composition and refractory qualities are not known. The Government may, it is suggested, make a survey and put out results, inasmuch as these deposits, if suitable, would benefit the Government as well as the trade.

(2) Labour :—

- (a) Glass-maker.
- (b) Blowers.
- (c) Blower's Assistant.
- (d) Firemen.
- (e) Crucible-makers.

There are few Indian Glass-makers available here and there who know glass-smelting fairly well. Glass-blowers are also available in small numbers, but many more will have to be trained. Firemen will not need much training in the case of small furnaces. Pottery workers can, with a little training, learn how to make, burn and glaze the crucibles.

(3) INGREDIENTS,—Sand.

Alkali.

Lime-Stone.

Sands used in glass-manufacture should be free from iron. The common river sands are not suited for making good white-glass but would do pretty well for half-green half-white

glass, of which cheap liquor bottles, etc., could well be made. There are many fine varieties of sand stones scattered all over which could be powdered and used. Lime-stones tolerably free from iron and magnesia (which greatly affect the colours of glass) are easily procurable.

For the supply of Alkali we have to depend on England for the present.

(4) Refining and colouring materials:—

(a) Saltpetre.

(b) Oxides of Iron, Copper, Chrome, Cobalt, Nickle, Lead, Zinc, Aluminium and Arsenic, etc.

(c) Barytes.

(d) Carbon.

Regarding the colouring and refining substances, saltpetre, carbon and some of the oxides are locally procurable. The rest are imported from Europe.

(5) Fuel, Coal or Firewood.

Coal could be got from Bengal. Firewood is a local product.

(6) PLANTS AND IMPLEMENTS:—

Blow Pipes.

Moulds for turning out (by means of mouth blowing).

Medicine-phials	} of different size and shapes.
Liquor-bottles	
Chimneys	
Soda-water bottles	
Tumblers	
Wine-glasses	
Jars	
Inkstands	

and such other articles as may be desired to be made.

Pressing machinery and moulds for making pressed glass-ware.

Working tables with the out-fit of necessary tools.

Finishing tools, consisting of :—

Scissors

Roll-shears

Cutting machinery

Grinding machinery

Stamping machinery, etc.

The manufacture of these articles has been specialised and developed, in Europe, to such an extent that the articles imported from there are not only cheap in price, but precise in dimensions and geometrical details. As the industry develops, and our own workers, gain experience there is every reason to believe that we would more and more be able to supply our requirements from articles of local manufacture.

(7) CHAMBERS for annealing glass articles.

These could be constructed on a side of glass furnace itself, so as to get the necessary heat by means of radiation alone.

5.—In the development of this industry, the first important step therefore is the establishment of an institution or factory where apprentices, who by hereditary occupation or personal aptitude are likely to take to the profession as a career, can be trained as practical glass-makers and glass-blowers. Provision may be made for giving to a few intelligent and educated men a special higher training to fit them for work as foremen in large concerns or Inspectors of cottage factories.

6.—A few centres possessing—

(i)—Facility for transport,

(ii)—Abundance of fuel supply,

(iii)—Nearness to sources of sand and lime,

may be selected and apprentices be induced to start work there.

7.—A *Depôt* may be opened in this centre and stocks of raw materials, colouring and refining substances, and cheap working implements, be all collected and kept there for sale to glass-makers in retail.

In places like Ferozabad, where glass-making has, so far as churi trade is concerned, long since developed into a cottage industry, there are private firms that supply all the materials required for the day's consumption to *sheeshgars* every morning and buy manufactured products in the evening. But it would take some time to induce people to start similar private concerns in the proposed centres. If, therefore, some Indian Prince, or the Government, take up the work in hand and temporarily finance a trained glass-maker and set him up as a general purveyor, to which position he may confine the functions of an Inspector of factories, offering glass-makers counsel and help and correct their mistakes.

Models of simple glass-smelting furnaces may be made and sketches of fire-bricks and fire-slabs required for the same be supplied to the several pottery works in Jubbulpore which would keep ready a small stock of them, to be supplied on demand.

Raw and burnt fire-clays could be obtained in bulk and kept in the *Depôt* for sale. Glass-makers would either make their own crucibles or all would combine and maintain a potter for the purpose.

Arrangements would soon automatically come into existence for sale of articles daily on spot as they are made.

8.—It would be desirable for the Glass-makers to confine themselves in the beginning to the manufacture of simple articles of every day use, such as ink-pots, medicine-phials, liquor-bottles, soda-water bottles, chimneys, lamp-stands, etc., for which there is a great and increasing demand in every locality.

Pressing machinery and moulds, which alone are costly, may not be introduced in the beginning though every apprentice would be instructed in their use and manipulation, so that he may buy and work the same as soon as his finances permit.

All apprentices would thus, after training, be in a position to start business, independently with a small outlay of money.

9.—In Japan, where glass-making has, thanks to Government aid and encouragement, attained to considerable importance within a short lapse of time, similar centres have been founded and Depôts opened where daily requirements of—

Raw ingredients

Colouring and refining substances

Crucibles

Fire-Bricks, etc.,

are all sold under one roof.

It is an everyday sight in those centres to see a household consisting of even three or four members working and maintaining themselves by a cottage factory of their own. The same man smelts the glass and does blowing, joined in the latter work by one or two other members of the family. A boy works as a fireman, while another perhaps a girl, operates as neck-maker.

Let the Government or an Indian Prince help in establishing at least one such centre in the country. When it is successful, private enterprise may be forthcoming to find others.

This industry affords an extensive field for employment of illiterate village labour.

10.—The supply of a cheap alkaline substance is a great necessity. The present European article is not only expensive in the first instance, but the excessive shipping and railway freights add enormously to its cost, coming as they do to nearly 60 to 70 per cent of the original price of the article.

Alkali in the form of sodium carbonate can easily be made from common salt by treating it with sulphuric acid and calcining and lixiviating the resultant. Iron pyrites, to make sulphuric acid from, are also obtainable in the country.

Sodium carbonate is an essential constituent in many other processes, such as refining of oils, tanning and curing of leather, manufacture of soap and paper, dyeing and bleaching of cotton fabrics and aerated water manufacture and all these industries would receive impetus from a cheap supply of alkali.

If this scheme is set on foot and my humble services or advice are of use in any way, they would always be at the disposal of the promoters.

11.—A facility greatly needed and which, if allowed, would be much appreciated and give encouragement, is the provision of some definite arrangement, at some Government laboratory where manufacturers could send specimens of sand, lime, alkali, ores, etc. for chemical analysis and obtain reports free of charge. The ascertainment of chemical composition of a raw material and the manner in which impurities or foreign substances, if any exist, could be eliminated, is often of substantial help.

12.—The growth of glass-making is greatly hampered by the levy of excessive rates of freight on Indian Railways. Sand, lime-stone, alkali, bangle-stone are all very cheap substances and should, it is suggested, be allowed to be carried at a rate of $\frac{1}{10}$ pie per maund per mile, when tendered in full wagon loads for carriage at owner's risk.

Similarly many of the chemical substances used in glass-making are more of the nature of ores than of refined chemicals quite cheap in price. They are now generally carried at,

Second Class = $\frac{1}{2}$ pie

Third Class = $\frac{2}{3}$ pie

or Fourth Class = $\frac{5}{8}$ pie

rate, which tell heavily on the industry. It is, therefore, suggested that all chemical substances which do not cost more than Rs. 15/- a maund be accepted by railways for transit, at *owner's risk*, as "Minerals" and charged :

$\frac{1}{5}$ pie—up the first 100 miles.

$\frac{1}{6}$ pie—extra distances up to 200 miles.

$\frac{1}{7}$ pie—extra distances up to 500 miles.

$\frac{1}{10}$ pie—extra distances above 500 miles,

irrespective of whether the articles are in large or small quantities.

Chimneys, tumblers, empty-bottles, medicine-phials, ink-stands, lamps, paper-weights, jars and other cheap glass-ware the price of which does not on an average exceed more than Rs. 15/- a maund by gross weight may be carried at owner's risk at 1st class rate = $\frac{1}{3}$ pie per maund per mile in small quantities, and as "Mineral" class goods when tendered in full wagon loads.

THE POSSIBILITIES OF A REVIVAL OF THE Hand Printed and Painted Cottons of Southern India.

BY

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Each succeeding year seems to make it a little more difficult to do anything adequate in the direction of reviving this interesting old industry, and still there are many persons who feel that this should be done.

Every now and again, some half-hearted attempt is started, which shews that at least from the artistic point of view a revival is still both possible and desirable.

I have elected to write of the cotton printing and cotton painting industry for several reasons.

A short time ago, on a visit to the Indian Museum in London, where I was making a study of old cotton prints and paintings, struck me very forcibly that among the fine collections there, there were specimens of comparatively recent date, though many, from wear and exposure were apparently of considerable age.

In looking about in some of the larger London furniture shops, I happened on an interesting collection of what were termed in the advertisements "Antient Persian Cotton Prints" and these curtains, Palampores and praying mats, thus labelled were nothing more Masulipatam works, and cloths from other places near Masulipatam, which had reached London through Persia, having been collected in the latter place by

one of the many dealers who search it for rugs and embroideries so much appreciated in Europe.

Though these prints were labelled "antient" and the salesman assured me that they were "very old". I recognised them as of identically the same patterns and stuff as work produced in the 80s. of the last century, examples of which are in the Government Museum in Madras.

I was also informed that the Indian Museum authorities had recently procured several specimens for their collection.

Among a certain class of collectors of works of art the words "very old", "antient" or "antique" have such a fascination that it enhances the value of almost any work to a prodigious extent, and consequently, though I do not suggest with deliberate dishonest intent in this particular instance, this collection of prints were sold at prices greatly in advance of their original value.

In fact, in some instances, as much as 8 or 10 times the original cost was marked as the present price.

Within the last 3 or 4 years, cloths similar in every respect but one, have been produced in Masulipatam.

I mention that the recently produced cloths were similar in all respects but one, for that one difference is a very important one, namely that of the cloth itself.

I think I am right in stating that the recently made Masulipatam cloths were printed on a fine, though somewhat weak cotton of European make.

The texture was delightful to the touch. Soft and delicate and smooth, but scarcely strong enough to withstand much wear.

The "old" ones had all these desirable qualities but were strong as well and I believe it was because the cloth used was of local hand woven make.

With the tendency which is gaining in England each year, toward a higher standard of taste in household decorations and the ever increasing demand for bright and well coloured cottons, cretones and chintzes, there is no sound reason, except that of general apathy toward minor industries, that should prevent the revival of this beautiful old work on sound commercial lines.

In July 1908, a writer in the *Madras Mail* who signed himself H. T. H. gave a delightful account of the old industry, and in a letter to the same journal a few days later, I supplemented his work by an account of what was being done at that time to keep the industry from complete extinction.

Since then, I regret to say the efforts so well begun have been allowed to fall into desuetude owing probably to the mistaken attitude of those who had attempted to revive the industry, toward the actual producers.

Want of understanding, or, worse still, want of sympathy with the workman make it increasingly impossible to procure good work.

However, with the idea of studying the methods of the men who had once been famous for these fine cottons, and if possible to interest some of my students in the work itself. I induced a few workmen who understood the processes well, to work in the School of Arts for a short time, copying and adapting from fine old examples, borrowed from the Government Museum collection.

In this way I learned the process, trying also to discover if there were any commercial reason why it should not be able to succeed again as it had in the past. In this direction, I was pleasantly surprised to find that very excellent cloths could still be made, even by workmen working away from their own homes and at fairly high wages, for moderate prices.

I hope now to suggest a workable scheme which will interest some reader of this paper sufficiently for him to put it into practice.

My idea would not require more than a very limited amount of capital, if worked with discrimination and intelligence, for I have only to suggest a return to the methods of our grandfathers.

That there is a good market ready for the output if the production is carefully supervised there can be no reasonable doubt, and the success of the Northern Kayasthas who have grasped the situation and who are reaping the benefits of their enterprise goes a long way to prove my assertion.

Though the history of the old trade in decorated cottons has been studied by several writers, all seem to have taken it for granted that the industry was destined to succumb to the changes brought about by the so-called "improved" methods of printing by machinery.

That this is a fallacy, is amply proved by the two facts that cotton printing by hand has never completely died out in Europe and that the workers in the United Provinces are still continuing the work to their advantage.

Machinery now-a-days is made to do very wonderful things, but it never has, and I am confident it never can be made, either to produce a work of art, or to take the place of really skilled hand labour.

It is the charm of the human element in hand work which makes discriminating purchasers prefer it to any machine made product, no matter how cunningly devised to imitate hand work but the increased cost due to the slower though infinitely more lasting methods, is a serious drawback in the modern commercial dealings. This is true more particularly of English or other European prints than of the Indian ones, and the very fact that good skilled hand labour is procurable here at a

moderate wage makes competition with European prints commercially possible.

Now the term "cotton print" is as I have used it above but a general term, and for the purpose of making myself clearer, I will discriminate and divide cotton prints into 3 divisions according to the design or pattern, and the use of the print when finished.

In the first division we will place the wholly hand painted curtains or draperies, properly, not "prints" at all, and these are usually decorated with figure subjects taken from the great Hindu epics or from Hindu mythology. Such, for instance as the cloths commonly made at Kalahasti, and at Kodali Karrupur and Sikkanaikampet near Kumbakonam. In this same division might also be placed, hand painted cloths, each complete in itself, which are decorated with flower or tree patterns.

With the figure subject, except in special cases where the workmanship is of a very high quality, cloths of this character would probably not find a very extended market, either in Europe or India. With the second class of this division, the florally decorated cloths, more could be done than with any others.

In the second division I would place the cloths printed from hand blocks, some done directly, other by variously worked processes of stopping out with wax before dyeing, or those partly printed and partly painted cloths such as are made at Ponneri and at Masulipatam.

These are the most commonly exported ones, at the present time, and besides the two places of manufacture already mentioned, are made at Kumbakonam, and Jammalamadugu.

The cloths of this division when of good quality, have always met with a ready market in Europe and in America, and they will probably always form the bulk of any considerable export trade.

The third sort is of a kind which is seldom, if ever made now-a-days in Southern India though I have seen specimens made recently in the north. This is the class of cloth which is much appreciated in Europe, and, could its manufacture be developed, would probably, ultimately prove to be the most saleable kind of all. I refer to those cloths decorated with small repeating patterns, which may be cut and made up without much interference with the design.

When made by machinery, this type of cloth is in pieces of considerable length, but when printed from hand blocks, pieces of 8 or 10 yds. in length are more easily manipulated and would prove quite long enough for most purposes.

The innumerable uses to which this type of cloth may be put, for furniture coverings, curtains of varying lengths &c. &c., without that serious interference with the pattern which generally must happen in the case of cloths each complete itself as a design, make it among Western peoples easily the most popular.

Still another class of pattern might be made which would be useful for many purposes, that is, a running border of from 6 to 12 inches in width.

As to the actual patterns of the cloths themselves, which is a matter of the utmost importance, no better criterion could be suggested than that the new cloths follow very closely the patterns and colourings of the old ones. By "old" I refer to practically all the cloths made before 1880, since which time the worst degeneracy both in pattern and colour has taken place.

But the "factor," as we may designate the controller of the output, should become acquainted from time to time with the class of pattern most in demand at any one time and intelligently arrange with the workmen to select from old examples, suitable models.

Fashions in these matters do not play a very important part, but they still are worth studying, and the old models give one a great variety of patterns to select from.

To imitate, in any manner, modern European models would be fatal to the success of this undertaking, though there have been many attempts to do this, all, without exception, dire failures.

The chance of old Indian work, aside from its hand production, is, that the patterns are Eastern and not Western.

Among much mean and worthless work exhibited at the Allahabad Exhibition in 1910-11 was a ridiculous copy in cotton of a modern European wall paper pattern.

My advice to any one intent on making a success of a cotton print revival, based not only on a knowledge of good and bad pattern, but also on what is most sure to find a ready market, is to begin by copying the very best old examples procurable, and to gradually, by the help of clever designers to branch out very slowly into new forms of work and new patterns which would be evolved naturally from the older works.

Thus has all good design been brought into existence, by slow but steady process of improvement and selection.

Two other points both of great artistic and commercial importance are, that insistence should be made that none but vegetable or indigenous dyes are to be used under any consideration, and that the cloth be hand woven, this last insuring sound wearing qualities and incidently being a help to the local weaver, who would soon produce the right kind of cloth for the purpose.

In the School of Arts experiments, the most successful results were got with hand woven cloths.

One cannot indicate much more definitely without actual illustrations the kind of pattern to be prepared, but it would be difficult to go far wrong if insistence be made that no "novelties" be introduced.

As to the practical ways and means best suited to a successful revival, once the factor has grasped thoroughly the preliminaries of design, colour and material, I have come to the conclusion after devoting considerable time to the problem, and studying as much as possible the economical condition of the actual producers, that the only useful way would be to return as I suggested above, to the ways of our grandfathers.

The worker must be financed, and he must if he is to keep off the land, be guaranteed that his work will be taken for a considerable period.

Advances on work in hand, probably both in materials as well as money, would be necessary. In fact, the factor should take a sympathetic and fatherly interest in his workers, allowing them every possible freedom consistent with the production of the right sort of work, controlling the actual production only so far as to insist on the proper materials, patterns and dyes.

So many times have futile attempts been made, lasting only a few months, to lure the old workers, who still remain, back to their charming industry, by meticulous persons who have never properly grasped the situation, that now, the better class of artisans capable of doing this work, have given up in disgust and are reluctant to leave other occupations to resume it.

A few practical suggestions as to size of cloth may not be amiss, as I have found that this is an important consideration in European markets.

For cloths each complete in themselves, the most useful sizes are 1, $1\frac{1}{2}$, 2 and 3 yards square, 2 yards by 3 yards, and 2 yards by 4 yards. These are all saleable sizes in western countries.

With cloths decorated with repeating patterns, a good width, from 45 to 54 inches is much more appreciated than widths of 1 yard or under.

Disappointments will probably await any factor who has not infinite patience, because at first, misunderstandings are sure to arise, but once the initial difficulties are overcome, I think it offers no more serious problems than the usual run of commercial undertakings.

The question of price, which I have purposely left for the end is a serious one. Prices may be kept down remarkably, if care is taken to deal only with the actual producers, thereby doing away with unnecessary middlemen who naturally all expect a good profit.

There is a market of sorts, for a very cheap and inferior print, dyed with startling colours and commonly sold in India for a few annas or at most a very few rupees, but I mention this sort only that they may be carefully avoided.

The large cheap shops of London, Paris and New York have plentiful stocks already of this sort, and they have been a very potent means of bringing discredit on good Indian work, besides having ousted better class work to a certain extent.

At any price they are dear, and their only redeeming qualification is that they are so badly made and of such poor material that their life is a short one. If they do not fade to worse tints than those they begin with, it is only because that would be impossible.

The best and most constant market is for a moderately priced cloth of good quality, both as to material, pattern and colour, which can be sold at a profit in Western countries at from Rs. 6 to Rs. 25, according to size.

Occasionally, though a large market would be difficult to find, a few cloths of very superior workmanship would find a market. For these, it would be difficult to set any price. So much depends on the execution of the work, pattern and colour and beauty of each separate piece.

Not many years ago, certain Rajahs paid up to Rs. 300 for single cloths, and I doubt not, that even these, if now procurable would soon find a limited market.

One other point which should be insisted upon after the actual production is accomplished, and that is, that care should be taken to deal only with firms of standing in Western countries.

Great and lasting harm has been done by unscrupulous dealers in Europe, who, by overcharging and so preventing large sales, have artificially enhanced prices to their own temporary benefit.

Only recently, at a large annual exhibition in Paris, an Indian dealer had on exhibition, Kalahasti prints purchased in Madras but a short time ago and for these he was asking prices at an advance from their cost to him of from 500% to 600% declaring them to be of great value and rarity.

So long as such trading is in vogue, large market of permanence would be impossible, but by dealing with houses of importance who are content to make moderate profits in view of large sales, it would not take long to regain for these fine Indian products the place they once occupied in the European Market.

I realize that I have put forward nothing new or startling in this short paper. I simply wish to create an interest in the revival of this beautiful work, believing as I do that it can only be accomplished by a return to former methods, so well suited, even now, to the conditions under which the artisan lives and has his being.

SUGAR-CANE CULTIVATION.

BY

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Last year I wrote a paper on Sugar Industry and dealt with different aspects of the subject. This year, I propose to make a few very practical suggestions which can very easily be adopted by the agriculturist as regards the cultivation of the sugarcane.

This article is only an abstract of my lecture delivered in the Nauchandi fair and at several other places by means of a Magic Lantern and which was written in Urdu and Nagri for the guidance of the general public. I shall feel obliged if any other gentleman will render it in the other languages of the country improving upon it according to the special methods adopted in his own province. The agricultural improvement is impossible unless our ideas reach direct to the cultivators and they are convinced of their usefulness. It is a pity, that the general public is illiterate and though it is very difficult to spread such ideas amongst the agricultural classes, a good deal can be done if small pamphlets be published and distributed broadcast.

Before beginning the subject I beg to apologise that I am only a layman and has a very little experience of the agricultural life and so naturally I may stand in need of correction on some of the points urged in the few following pages. I shall feel obliged if my mistakes are pointed out and shall try to rectify them as soon as possible. Ancient writers referred to India as a country producing a plant of honey (sugarcane) which shows the utter ignorance of the other countries about sugarcane. We also learn that Alexander the Great was the

first to take this plant to his country and from there its cultivation spread to the other parts of the world. A country which discovered the utility of this plant, it is a pity, is now unable to compete with the foreign countries which learned this art originally from it. However it is not too late if we take care of ourselves in time and make a scientific research into the matter. The extent to which we have gone backward will be clear from the fact that in 1889-90 India exported 72,000 tons of sugar to foreign countries and since then there is a gradual decline in this trade. Instead of exporting we began to import sugar from foreign countries and the imports are daily increasing as will be clear from the following table :—

Year.	Cwts. Cane Sugar imported.	Cwts. Beet Sugar imported.	Total.	Price in Rupees paid.
1902-03	3,529,678	147,517	4,987,195	4,76,98,243
1903-04	5,485,378	552,737	6,038,110	5,77,23,413
1904-05	4,833,309	1,716,488	6,549,797	6,71,08,487
1905-06	4,262,929	3,433,262	7,696,191	7,50,02,109
1906-07	5,926,848	3,803,834	9,730,683	8,18,28,277
1907-08	9,250,841	794,040	10,044,901	8,79,19,287
1908-09	8,719,289	1,944,024	10,663,283	10,40,97,056
1909-10	10,276,878	859,206	11,136,084	10,97,82,740

Thus we see that we are irretrievably losing ground and unless we take up the work of its regeneration in right earnest, the industry is doomed. The industry would have been doomed long before now, but owing to the religious prejudices, we have been able to hold our own to a certain extent. But a country cannot compete with another on religious basis alone for a long time, unless some economical principle be adopted.

Generally an idea is gaining ground in our country that we cannot compete with the imported sugar, because the foreigners manufacture their sugar out of beet—a root which becomes ready for the machine in 4 months time, while we manufacture sugar from canes the crop of which does not ripe before a year. Thus a clear length of time is the cause of this difference. But this does not seem to be a proper explanation of the situation, as the foreigners do not export to India beet-sugar only but also they are able to compete with us in our country as regards cane sugar, as will be clear from the above table. Besides this there are a few more facts worth consideration. A beet plant requires more land than 4 or 5 cane plants; the beet plant contains 7 to 14% of sugar while cane plant contains from 10 to 20% of sugar; and lastly the cane plant is a few feet long while beet plant is only a very small plant. Besides the above, as regards the method of manufacturing sugar the method of beet sugar manufacture is very costly and requires a great deal of chemical knowledge. Perhaps it is impossible that it may ever be adopted on the small scale by the agriculturists of India as they are able to do something in cane sugar manufacture with a very small capital. Leaving, therefore, aside the idea of beet cultivation I shall deal only with the cultivation of cane sugar and shall suggest some practical improvements that can be introduced at once.

It is a general idea that the Indian land is the most fertile in the world but since the discoveries made in the science of agriculture it has been falsified and if we compare the produce of different countries we are at once led to believe that by the advent of new systems the position has been changed. The yield of canes per acre in India is about 362 mds. but the produce in other countries is as under:—

Quebea	560 Mds.	Hawii	2800 Mds.
Java	1120 Mds.	Mauritius	980 Mds.
Peru	1680 Mds.	Barbadose	1120 Mds.
Triunidid	420 Mds.	Egypt	616 Mds.

This is a clear proof that we do not produce cane per acre as much as the foreigners do and this too goes a great deal in favour of the cheap price at which sugar is sold in our country.

This is due to some defects in our method of cultivation. I have tried to give in detail as far as I can in the space at my disposal the different points which are essential for our consideration.

Structure of Cane Plant and The Selection of Cane Seed.

The most injurious idea that our agriculturists have taken to heart is that they will use the cane seed produced in their own land however inferior and diseased it may be. The importance of a good seed has never been brought home to our agriculturists. They do not know that the plants will be diseased and unhealthy if the seed from which they are grown are unhealthy. Therefore our first attempt should be to advertise and teach our agriculturists the importance of a good seed saying nothing as to why a good seed is necessary. I proceed to give the necessary points to be considered in selecting the seed. But before going further I wish to write a few words as to the "seed" itself. The canes all over world are produced by means of cuttings and these cuttings are thought to be seeds of the future plant. The cane plant flowers and gives seeds as well but it is never allowed to reach that stage as by that time the whole juice is dried up and the cane plant then give only the seed but not the juice. But in the case of cuttings we lose only a small portion of the cane and can use the remaining for the manufacturing purposes. This consideration and also the consideration that for cutting purposes only the top is found to be the best being full of nitrogenous matter necessary for the growth of the child cane have led to the general adaptation of producing canes by cuttings. But in foreign countries the botanists and horticulturists allow the canes to bear flowers and after by the process known as cross fertilisation the seed is obtained. Thus new varieties of canes have daily

been discovered and the foreigners have been able to produce canes which can give the largest percentage of sugar in their juice and which are best suited for the soil at their disposal. Towards this important branch of cultivation our attention has never been drawn but however thinking it to be impossible at this stage I have given only a hint for those who are interested in this branch of science.

Some gentlemen have also suggested that we should import the seeds from foreign countries and cultivate the same quality of canes. I am with these gentlemen but beg to say that it is not necessary that those kinds may suit our climate and soil and thus it is just possible that these kinds may prove inferior to our already existing kinds of canes. Therefore I suggest that some big zamindars and the Government be pleased to experiment upon these kinds and publish the results ; if successive experiments prove that these kinds will be beneficial then we may adopt them otherwise not. However it seems to be necessary that our agriculturists should note that following points while selecting cuttings for their next crop of canes.

The canes from which the cuttings are obtained should be (1) juicy (containing as little begass as possible), (2) sufficiently thick, (3) of joints at a long distance *i. e.*, the length between the joints be as great as possible or should consist of as few joints as possible, (4) sweet, (5) drought resisting, (6) healthy never affected throughout season by any disease, fungi or frost etc., (7) of healthy complete eyes, (8) of very thin joints, (9) long, (10) full of juice inside, (11) of a very thin bark, (12) should not crack on the joints and split up in twain.

I need not dilate upon the above few points any further but a few remarks will be quite sufficient. (1) There are several kinds of canes which give a very good percentage of sugar when we take the proportion of juice and sugar obtained but when we take the weight of the canes themselves they are thought of giving the least percentage. This kind should be very discarded. The bullocks required for crushing these canes should be very

strong and take very great time in obtaining the juice out of them. Their juice no doubt is thicker than the ordinary canes but they are not juicy. Such kinds should be done away with. (2) The thin canes are always found to be short in stature and the proportionate juice obtained from them will be far less than the juice obtained from a thicker kind. The quantity of begass is very high in these canes. (3) The juice is obtained from that portion of cane only which is between the joints. Therefore the fewer the joints the more will be the juice obtained. The joints do not contain any juice but these are only the natural stops to ripe up one portion of the cane. (4) The sweeter the cane the higher will be the percentage of sugar. (5) The country to which we belong has not advanced so far as to get rid of the natural supply of water altogether. The means of irrigation are very limited. The canals are stopped any day as they depend solely upon the supply of water in the rivers from which those canals are cut. The irrigation from wells is very limited and costly. Thus the crop of cane which requires the greatest amount of irrigation solely depends upon rains. The rains being very irregular we should select some kinds of canes which may be drought resisting. In our province there was a kind of cane juice known as मेरति *meeruthi* which was very juicy and used to give a good percentage of sugar. But its cultivation has nearly been stopped altogether because of want of this quality. Though tillage and other necessary precautions will help the plants in not being destroyed by drought but still it is necessary that in those places where irrigation cannot be certain and sufficient, only drought resisting kinds of canes be cultivated. (6) It cannot be denied that an unhealthy plant must have an unhealthy effect upon the plant produced by the seed obtained from it. So quite sound and healthy cuttings be used for the crop. (7) The plant always grows through the eyes of the cuttings; if these eyes be not sufficiently safe and sound no plant is possible. (8) This too has already been touched upon in 3. (9) The child plant will be wholly dependent upon the father plant and hence this qualification necessary. The lengthy the canes the higher will be the amount of produce. (10) There are several kinds of canes which

have a kind of white matter inside them and which are quite devoid of juice. In certain kinds this white matter is only found in the shape of thread only but in others it is thick enough. This kind should be avoided. (11) If the bark of the canes be thick it will not only give an inferior percentage of juice but it will require a greater force for crushing the same. (12) There are several kinds of canes which when broken by hand split up in twain very easily at the joints. This is also very great defect in canes. When these canes go into crushing mills they are easily broken off at the joints and the rotters do not easily catch them after they have broken. Thus the person feeding these cane mills have to exert himself much so that the roller mills may catch them and crush them. At times when he becomes a little careless the labour is lost for nothing and the crushing mill rollers revolve without producing any juice or crushing any canes as they have already left off their work because of the breaking at the joints.

It will surely happen that there may be many agriculturists who may not have their fields devoid of such defects as are adverted to above but this can be very easily remedied by taking the cuttings from the fields of those who have got good canes. This is a bad economy to use our own bad cuttings for a question of a few annas and thus to loose the whole coming crop. This is also possible that there may be no field consisting of only one best kinds of crop of canes ; in that case the selection can be made from each field separately. The workers who clean up the trash and cut the cuttings should be directed to take the cuttings only from those canes which are good as regard the qualifications enumerated above. In the evening the agriculturist owner himself may go to his field and within a few minutes look into the cuttings whether the workers have followed his directions. If there be found cuttings from defective kinds or plants they should be rejected and used for crushing. He must insist upon having the best cuttings set apart for growing purposes.

One thing more should be taken to heart that the cuttings should be followed only when the canes are sufficiently ripe as no raw cane will be able to produce another cane from its cuttings. I think if these directions be followed each year in every village we shall find a better produce every year and a good deal will be done within a short period of a few years.

Preparation of the Field for the Cane Crop.

Before dealing with the preparation one point is necessary to make note of. We must understand the root of every crop before dealing with the subject as what kind of field will be good for it. The plant gets its food from through the roots ; if these roots do not go so far where the stock of food is the plant dies out. Therefore it has been found necessary that the land should be well ploughed and tilled so that the roots may penetrate deeper. The tertiary roots which go deep down in search of food can only work when the land be sufficiently pulverised. It can be clearly understood from the above that the health of a plant depends solely upon the vast space of land at the disposal of these roots. In European countries the agriculturists have found the roots of cane plant as deep as 8 feet or 10 feet but in India these roots are hardly able to go more than 2 or 3 feet deep. This is due to the fact that in foreign countries very deep ploughing is practised while in our country the plough goes a very little deep.

Generally after the rabi crop is cut the cane cuttings are planted. After watering the field the agriculturists only plough once or twice and sow the fields. It is a great mistake we should prepare the fields as we do in the case of wheat at least 7 or 8 ploughings are necessary before the cane is planted. If farmyard manure is to be applied it should be mixed in the field while ploughing as it produces disease when mixed afterwards. If the farmyard is not well mixed in the field it is not only as useful as it ought to have been but generally the insect known white ant (दीपक) is produced which becomes a source of trouble to the agriculturist. If the land be not sufficiently strong to give a good cane produce sown some legamous crop as

pea, hemp, indigo, etc. and when this crop bears flowers cut them off and well mix in the field. This will make the field very strong and the yield of the field will be very much increased. Do not cut and mix indigo unless the field be very poor, otherwise the canes will be so long as highly manageable and will be found very juicy containing a very little percentage of sugar. Allow the indigo crop to ripe and then cultivate the cane crop. This will be quite sufficient to give a good yield. Other crops can be cut and mixed safely in the field. When they are cut and mixed, water the field well so that the stalks of the previous crop be well and fully turned into manure. If you are to cultivate canes in a clayey soil sow उदर (green gram) or गवार (gammar) or spinath before the cane crop. This method will render the adhesive power of the clay futile and the land will become easily pulverised. Perhaps the agriculturists will object to it that in this way they will have to lose one crop for nothing but if calculations be made it will be quite clear that it is a wrong idea. The cane crop will repay the whole loss and the field will require hardly any manure for a few years to come. Generally the cane is planted in a dark clayey soil but सेवड़ा (loam) is also a better kind of soil for canes and it is said by the experienced agriculturists that the canes of this land are sweetest than the canes grown on any other land. But sandy soil will be the work as requiring the greatest quantity of water. Every other day the field will look dry.

The field should not contain crude carbonate of soda known as रूहे. These fields do not give a good percentage in sugar as they generally contain a very large quantity of acids which turn the juice into inverted sugar. The agriculturists should not sow sugarcane in fields affected by this.

The sugarcane should always be sown after growing some crop whose leaves fall to the ground in abundance so that great amount of manure may not be necessary. The agriculturists should note that a kind of good cane is changed into worse kind by sowing the same in a bad field, therefore selection of seed should be done every year without fail.

Sowing of Canes.

After cutting the canes for seed they are put slanting in a small pit and covered with earth. These are occasionally watered and remain there till they germinate and the proper season of sowing them comes in. This is done with a foresight and is a very good old system. If the cuttings be at once sown they will require a great deal of care in the field and on account of want of care they may be destroyed. But in a small space the cuttings of several bighas can be put together and taken care of. Besides this a change of place after germination proves very healthy as in the case of onion and tobacco which are always first in a very compact area and then afterwards transferred to other fields. But the agriculturists generally do not take care of these cuttings after putting them there though they require a great nourishing care. Two or three points are necessary here to enumerate. The earth which is put over them should be very thin only to keep them safe from sun and animals. This thin layer of earth should be covered with a very thin layer of cane leaves (trash). The earth with which they have been covered should be thoroughly loosened and no water should ever be sprinkled over them. There should be a free access of air through the earth to these cuttings. If rain falls in the meantime the trash will not allow it to penetrate the earth covering easily and thus to make it hard. If the above covering be made stiff on account of moisture the excess of air will at once be stopped and the germination will suffer. Sometimes the heat so produced on account of want of air spoils these cuttings and turns them black. If anyhow the earth becomes stiff either on account of the usual and necessary watering it should be loosened by a small iron spade or better with a bamboo stick split up in twain so that the newly germinated stalks of the plant may not suffer. This place should be watered every now and then and the water should be given so carefully that only the bottom of these canes be irrigated and water should hardly reach the upper thin layer of earth. Thus you will see that all the eyes of these cuttings sprout forth and they will give a healthy crop. These cuttings have been seen to become whitish and sometimes eaten by white

ants or become black. These are very sure signs of the diseased cuttings. They become white on account of more moisture than required. White ants are generally removed by proper irrigation and the cause of their turning black has already been given above. The cuttings should remain always in these pits as long as they have not properly germinated. But the germination should not be allowed to develop a long period otherwise the shoots of these cuttings will join together and it will be very difficult to separate them when required for separate sowing. If these precautions be properly attended to I do not think any trouble will arise at all.

There are about five ways generally found in the world in which these cuttings are sown. The first method which is largely followed in India is that one man ploughs the land and another puts these cuttings in the furrow at a foot apart. These cuttings as some as they are dropped into these furrows are pushed aright by feet. In this practice there are many defects, one is that this work is generally entrusted to the small children who very carelessly handle these cuttings and generally break a good many germinated eyes of canes. If they are not broken in handling they break them by putting their feet upon them and then they do not see whether these germinated eyes are upwards or sideways in the furrows, because, if they are put downwards they will either die of the pressure of foot at once or being under the pressure of the cutting itself will die. If they will survive they will only come up sideways and thus will have to undergo a great resistance in their very infancy which will be a cause of their perpetual unhealth and weakness. This method of course is the cheapest and best suited as regards simplicity but it must be properly done by the grown up men and never entrusted to children. This will entail of course a loss of few rupees a year but this loss will pay itself and the agriculturists should not grudge this loss. Of course there is one drawback in this method of cultivation which is impossible to be remedied. If the furrows be very deep the cuttings will be put deep and thus the crop will not properly germinate and if the furrows be not made

deeper the roots will not be able to deeper down into the surface of the field and thus be unable to supply the plant with sufficient store of food. This can only be remedied in this way that all the ploughings previous to the last be done very deep and the last should be done ordinarily deep so that the whole portion of the cuttings may well be covered with earth. In this method in order to avoid these defects the cuttings should be sown very near to each other.

The second method of sowing these cuttings is that the holes are made in the field manure is put in and the cuttings are put straight in these holes. It is a very useful method of cultivation and is adopted in most of foreign countries.

This method is very highly thought of inasmuch as the manure is applied in a very small quantity and can be very easily assimilated by the plants. Another point of advantage in this method is that the earth can be easily dug deep for the roots of the canes. Besides these it proves very advantageous in after hoeing, watering and binding. The field looks very beautiful and attractive. No doubt the cost of sowing is very great in this case but considering the cost of spreading manures, the quantity of manure and the sowing in the cuttings employed will repay the extra cost. Besides this the produce will be much more than in the previous method. There is an objection raised against this method. People say that generally in each cutting there should be at least 2 eyes if we sow in this method the underneath eye will go very deep and will be destroyed the upper eye being too near the upper surface will be easily exposed to be climatic effect and will suffer. This objection is very sound but in practice it has been found to be of no avail as in this case the distance between the two eyes is not generally much because the portion of the canes from which these cuttings are received *i. e.* top have joints at a very small distance and secondly it remains with the sower to sow them deep or not. However this defect is easily removed by putting these cuttings in a slanting position and thus reducing the distance between the two eyes. For the purpose of sowing by this method the

agriculturists have invented machines and thus the cost has been reduced to the minimum. But I do not suggest buying these machines by every agriculturist as it is just possible they may not pay in our country. Their trial should be limited to the wealthy agriculturist and the Government and they can be adopted by ordinary farmers afterwards. But after flowing furrows may be opened in the field by ordinary plough and in these furrows at equal distances the holes may be made by ordinary hoe. In this way the cost of employing this method will be very limited.

Third method which is described in the following lines was perhaps once employed in India and we have forgotten it. The furrows are made by a plough and the cuttings are dropped in these furrows the man sowing these cuttings puts his foot upon the last end of these cuttings ; in this way the one end of these cuttings goes deep down into the earth and the other remains slanting which afterwards is covered by the earth. This method can further be improved if the manure be spread underneath and above these cuttings at the same time. This requires no more labour and our agriculturists will find it much similar to the first method already in vogue.

The fourth method is to grow canes by means of ratoons. One sowing in foreign countries lasts for 20 years while in our country the ratoon sowing is being abandoned altogether. In ratoon sowing there is no necessity of new cuttings but as the food which was available in the field has already been taken by the previous crop it is necessary that manure be employed in good quantity in these fields. In order to grow canes by means of ratoons the field is burnt after cutting the canes. The burning gives three most important advantages :—(1) the cane shoots out more by burning, (2) the soil becomes more porous and thus the roots can go deeper in the soil and thirdly the insects which infected the previous crop will be destroyed. The experience of foreign countrymen and our own has shown that the yield by means of ratoons gives better and more crystalised sugar than the canes grown from the cuttings. If proper manuring be

attended to there is no cause why ration growing will not prove beneficial as did in the olden times.

The fifth method is by sowing the canes by seeds. This has already been described and there is no necessity of repeating them here again.

The cuttings before sowing if steeped in the water of copper sulphate or the decoction obtained from the leaves of बांसा or salt and asafetida water or petroleum and water or तिलकी खली (sesame cake) will not be affected by insects or other injurious grubs. But the agriculturists may very well object that it is very difficult nay impossible to steep the cuttings in any solution of this sort. This can be very easily effected however in this way. Before sowing water these cuttings and put any one of the above solutions in a vessel just near them and make a hole in this vessel. The solution will trickle down this vessel and will be easily dissolved in water. Thus all the cuttings will be very easily saturated with solution or they may be sprinkled upon by these solutions when sowing. Out of the above solutions the copper sulphate should be used very sparingly as this proves injurious to the germination if applied in large quantity.

Manuring.

The list of manures is exhausted by the kin farmyard manure in India. Our agriculturists know only the use of farmyard manure and nothing else. Before giving in detail the few important manures I wish to bring home the necessity of manures. If we take any plant and burn it it will leave ash which is nothing else than the earthly portion of the plant. Thus we can easily see that the land is deprived of earthly matters by as much as the ash is obtained by burning the crop produced. The ashes are all of different structures when they are chemically examined. This shows that every crop takes different kinds of chemicals from the earth. Thus by analysing the ash we can calculate the quantity of different articles of

which the land has been deprived by a certain crop. If the same crop be sown over and over again in the same field all the chemicals which are necessary for the growth of that crop will become less and less every year and hence the yield will go on decreasing ; so it becomes quite clear that we should restore the land with the same amount of chemicals which the crop has taken and thus the field will remain as fertile as ever. Besides this the chemicals required by plants are only taken when they are in the state of assimilation, *i. e.* if a certain chemical required for the growth of the canes be present in the field it is not necessary that the canes may assimilate it, but unless it is made in the soluble condition required by the nature of that plant it will not be utilised. Just as a man cannot digest many chemicals such as iron etc. by directly taking them but in order to make them part of the body some other chemical change in iron is necessary according to the medical science. So is the same case with the plants. This work is done either by the natural phenomena of air, water and sun or is helped in a great way by the manures employed. Thus manures serve two distinct purposes one is to restore the quantity of chemicals taken from the land and secondly to make the necessary chemicals required for that crop in an available condition. The subject is too long to be given here and I am unable to deal with the chemical side of the manures. I have only pointed out the two important functions of the manures.

Without dealing with the chemical side of the question I wish to give only a few practical manures that are quite necessary for the sugar-cane and can be very well prepared by every agriculturist. The best manures for the sugar-cane are those which contain a large quantity of nitrogen. Nitrogen is generally applied to fields in the form of ammonia or nitre or farmyards manure. If any of the readers will look into the manure list of any European firm he will at once learn a good many things used for the purpose. In India in our province Messrs. D. Waldie and Co. of Cannagar, Calcutta who have their branch also at Cawnpore manufacture special manures for different crops but

as I have made no experiment of them I do not recommend them but of course ask the Government and other well-to-do agriculturists to try them and publish the results. However I wish to suggest that in foreign countries sulphate of ammonia is thought to be a very good manure for the sugar-canes. But the price of this article seems to be prohibitive and I do not think it will be useful if bought at this price. I would have given the method of its preparations but in doing this I shall be going out of my scope so I proceed to give in detail a few cheap manures as under:—

Nitre खारी.—In India there were good many places where saltpetre was manufactured. Though the manufacture of this article is daily decreasing and almost stopped at several places owing the cheapness of the imported article but at least every agriculturist knows the earth from which saltpetre was prepared. In several places the mud of houses is turned into this kind of earth on account of their exposure to the sun, air and moisture. This earth is a very important manure for cane fields. It is very cheap and can be used with advantage. It makes all the necessary available food ready for assimilation by the plant. In places where this earth cannot be had saltpetre of commerce can be used for the purpose. $1\frac{1}{4}$ mds. to $1\frac{1}{2}$ mds. of saltpetre is sufficient for an acre of land. This should either be well mixed in ordinary earth and then spread on the plants or better if it is mixed in water by putting a proportionate quantity on the channel of each plot while watering the field. Thus the saltpetre will be quite mixed with water and will at once be taken up by the roots of the plants. The rate for saltpetre of commerce is about 3 as. a seer or Rs. 7-8 a maund.

Farmyard manure.—This manure is largely used by all the agriculturists but the method in which it is used is highly objectionable. The value of a good manure is estimated by the quantity of ammonia it contains. But ammonia is a highly volatile gas and thus the manure which is left exposed in the air gives off a good quantity of ammonia and is lost for ever. Therefore the farmyard manure is no more a good

manure. This defect can very easily be managed by putting occasionally earth upon the heap of this refuse. This will stop to a great extent the waste adverted to above. If commercial sulphuric acid be well diluted and sprinkled occasionally over the manure, ammonia will be fixed and will turn into sulphate of ammonia. The other point is that the rains when fall upon these heaps dilute this important quality and carry it to the surface where it is saturated and lost for ever. This can be very easily avoided by putting a shed over these heaps. The third point in connection with this manure is that a good deal of this important article is lost by using the cowdung cakes for cooking and smoking purposes. If fuel be substituted for this purpose this important article of manure will be saved and applied for the purpose.

Urine manure.—Urine of animals contain a very large quantity of nitrogen and hence its importance as manure cannot be ignored but all our agriculturists take no notice of it. It is all lost. This can very easily be utilised by putting sand always in the night under the cattle as bedding and when saturated with urine the saturated portion may be sent the heap of manure. This will keep the cattle comfortable and a waste will be turned into a good manure. The same object can be achieved by putting the trash (cane leaves) under the cattle. If a better drainage be planned in the cattle shed the all urine will be accumulated at one place.

Scum manure.—It has been calculated that the scum taken off the juice while evaporating the cane juice contains the largest quantity of nitrogen. This scum may be mixed with earth and spread on the canes. It may be said that it is now-a-days used as a cattle food and proves very useful. But it has been seen that the cattle generally eating the scum are affected by itch and thus it is very injurious to the cattle. Moreover if this scum be washed with a little water the whole scum will be deprived off the sweetness it contains. The only thing which the cattle relish is the sweetness it contains; if necessary the sweetness which has been got by washing the scum can be used for the purpose.

Green manure.—If some crop be cultivated and mixed in the field it is known as green manure. This has already been enumerated in the previous pages.

Irrigation and Hoeing.

The sugarcane consists of nothing else but juice and thus it is all watery. If water be not available for the roots the canes will be withered. But in a country like India it is very difficult to get a proper supply of water. Several schemes for better irrigation have been tried with failure.

Circumstanced as we are, no new method of irrigation can be suggested at this stage. But, however, one fact is worthy of note that if the earth be well pulverised and properly hoed the water will be required in a very small quantity. If a thin layer of pulverised earth be formed on the surface of the field water will not easily evaporate. This fact was very well taken note of in olden times. There is an old proverb,

Chyar Kyare chaudha ugoda

Phir dekhe ganne ka lodh.

चार क्यारी चौद उगोद

फिरदेखे गन्नेकालोध

It means that for the whole season 4 waterings and 14 times hoeing is necessary. The advocate of dry farming has clearly proved that even without watering any crop be produced. Regret to note that this important point has been discarded by the agriculturists. In olden times the hoeing was very ably done and often times but now a man will hoe $\frac{1}{3}$ rd of an acre in a day while in olden times at least three men were required to do the same work. They hoe the field in these days only to have the satisfaction that they have done it. The roots be well hoed in and every foreign plant or grass be removed carefully. If proper hoeing be done I am sure that the crop will be much more in quantity than it is in these days.

Where the fields are irrigated by canal this injurious practice is invariably adopted. The importance of hoeing should be taught to the agriculturists.

Canal irrigation is generally done very carelessly and more than necessary water is used. This makes the plants look pale when the rain set in. So the water should be used as carefully as we do where we irrigate our fields by wells. More water destroys the natural heat in field and the coldness of these fields prove injurious to the crops.

In some fields there are patches quite devoid of productive power made on account of careless watering.

The other point in canal irrigation which is necessary to make note of is that if water goes with a high speed over the field the upper surface becomes an impediment for deep saturation. Irrigation is said to be only beneficial when the water percolates to the depth of the roots of the plants which is generally not attained in the case of canal irrigation. If water of canal may have as slow a flow as that of well water the fields will require water after a great many days. This can be very easily effected by giving water in several portions of the field at one and the same time. This will, of course, take a greater time to irrigate the field but however experience will show that it repays well.

Binding of Canes.

The canes grow to a tolerable height and hence when the wind blows and the surface of the field is saturated with rains they fall down and the whole field is destroyed. In order to avoid this evil some 5 or 6 canes are bound together when they are a few feet high and when they grow still higher 2 groups of previously bound canes are again bound together and so on. This is a very common practice. But the agriculturists begin it sometimes very late when the canes actually bend to one side or the other. This should begin very early. In every field whose canes are sufficiently healthy canes should be bound together

very early. The most fatal mistake which the agriculturists generally commit is that they bound the canes at the place wherefrom the arrow begins and tie them too tightly. Both these mistakes should be avoided. When arrow is tied up the growth is ceased and the canes begin to sprout forth at the joints and thus the whole juice in the cane is turned into acid. The growth becomes too slow by tying them too tightly.

One more fact in this connection seems to be worth of notice. In foreign countries the dried leaves of canes are removed from the canes when they are sufficiently grown up. In this way the air and sun have free access to them rendering them healthier and robust. The other advantage derived from this practice is that the surface is covered with these dry leaves and hence the sun's heat do not evaporate the moisture soon. This water is required in much less quantity. This we can also practice but there is one point against the introduction of this practice. These dry leaves are left by nature in order to save the canes from the accidental change in the season and specially the frost so if the canes are to remain standing up to the time when they are likely to be attacked by frost this should never be done otherwise this will prove highly beneficial to us as well.

Diseases of Canes.

I had a mind to write a few pages upon the diseases of several blights but thinking that their description without the remedies will be of no avail I do not propose giving them. Though the remedies occasionally pointed out by eminent agriculturists will have proved beneficial to one as well but nothing can be said about them unless they are tried and results assured. But however a few points in this connection I think necessary to enumerate.

In olden times, my idea is, the Indians were far better agriculturists than the people of foreign countries are to-day. No doubt so many machines were never invented by them but that is no sound objection to doubt their learning and power of

observation as the machines which are daily invented are nothing but the remedy of this hard competition which has set in the modern times and unknown before. In olden times the canes and other crops as well were surrounded by sowing the castor or the hemp seeds. Now my inquiry into this matter has proved that if the canes be properly surrounded by the hemp plants or castor plants they are never affected by the cane borer insect which the most fatal insect to the crop. If there be cane crops generally affected by this insect every year a few rows of either of these plants may be grown in the fields amongst the canes as well to ensure a better success. I think this discovery of Indian agriculturists will be universally adopted in no time. Besides this it has also been proved that if proper attention be given to hoeing and watering the cane crop will remain healthy and strong..

With these few words I take leave of my readers and pray to Almighty that He will give us sufficient knowledge and strength to hold our own in the struggle of life in this world as we could in the past.

PROSPECTS OF SUGAR INDUSTRY IN INDIA.

BY

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Introduction.

In the economic history of India the past and present of the Indian Sugar Industry is a subject so peculiar, so complex and intricate that so far it has exasperated the men engaged in the industry, has puzzled the Administration and bewildered the outside world. India is commonly supposed to be the home of sugarcane. From the Roman period up to the end of the 17th century the whole of Europe depended mostly on India for supply of sugar, The climate and soils of India are well fitted for growing cane. And yet the present position of the Sugar Industry in India is so precarious that grave doubts have been entertained about its stability. India has long ceased to exist as an exporting country, the annual imports now exceeding 700,000 tons.

How this change was brought about is a matter of history. It has been fully dealt with by Sir George Watt in his Dictionary of Economic Products in India and it need not be repeated here. But to comprehend the present position it will be necessary to indicate the main stages by which the downfall was brought about.

Up to the 15th century the exports of Indian sugar to the Western countries, though considerable, were not organized on any solid commercial basis. The trade was somewhat irregular and mostly in the hands of Arabs and Italians. Since the arrival of English, French and Dutch a more or less regular

trade was organized, and the exports of Indian sugar increased rapidly. But by this time sugarcane was introduced in the West Indian Islands, and a competition of the West Indian sugar in European markets was the natural consequence. The West Indian planters felt this competition very severely and soon the various European Governments took steps to protect their plantations, by means of tariff regulations. In order to protect the West Indian plantations a duty equal to 50% was imposed by England on sugar coming from India. With such heavy duty it became very difficult for the Indian sugar to compete with the West Indian sugar in European markets. The East India Company, in whose hands was the Indian export trade of sugar, protested against this, but in vain. Attempts were made to ship Indian sugar as ballast, so as to reduce the shipping charges. It is said that in order to escape the duty a few attempts were made to ship Indian sugar to West Indies and thence to reship it as West Indian sugar. But under these circumstances it became nearly impossible to maintain the Indian Export trade. Eventually the duty on Indian sugar in England was reduced. But by this time the West Indian plantations had been so much improved and strengthened that they were in a position to stand the competition. During this period no attempts had been made to improve the Indian Sugar Industry.

In the second quarter of the last century the Government made some attempts to improve the condition of sugar trade in India. New varieties were introduced, West Indian methods of cane growing and manufacture were tried. But these attempts soon proved to be more or less failures. Still India was in a position to maintain some export trade in raw sugar. But by this time another competitor arose in the shape of Beet Industry in Europe. In majority of the European countries this industry was organized by direct Government help. Various scientists and capitalists fostered the industry, and the progress so rapid that except England no other European country required any sugar from India. Then the Bounty

system came on the scene that hastened the complete ruin of the Indian export trade and India began to import sugar.

During this period no attempts of any importance were made to effect any improvements in Indian Sugar Industry. Sugar Industries were being organized on a scientific basis and on a vast scale in various other countries while people in India were snoring, leaving the industry to natural decay. At last by the end of the 19th century the pressure of competition with sugar produce in Europe began to be keenly felt not in the export trade now but in the home market. The export trade from India had practically vanished. The imports of foreign sugar into India began to increase by leaps and bounds. Now the Government found it imperative to take some decisive action, and an attempt was made to remove the immediate cause of this competition. Accordingly in 1902 a duty countervailing the bounties was put on foreign sugar entering India. But by this time the European Beet Industry had become so strong that it no longer required any need of bounty and accordingly next year by the Brussels "Convention" the much hated bounty system was abolished in Europe.

As a result of the countervailing duties the imports of sugar from Germany and Austria into India diminished. But there were several other cane growing countries which had kept abreast in the improvements unlike India. As soon as the bounties were abolished these countries got free scope for expansion of their sugar industry and they began to dump sugar into India. Amongst these Java is foremost. In 1904 the Swadeshi movement was organized in India and it was hoped that this movement would do to Indian industries what the bounty system did to sugar industry in Europe. But the movement had two drawbacks. In the first place in the

Swadeshi movement the bounty is voluntary and based on sentimental grounds. Hence it has not been very effective. Secondly as regards the sugar industry the campaign was organized more on religious grounds rather than on economic grounds. People were asked not to use foreign sugar because it was purified by animal charcoal and such other noxious substances and therefore impure. The effect of such an argument was that Java saw its opportunity. The manufacturers in Java proved to the satisfaction of people in India that their sugar was not made by any impure methods and was therefore acceptable on religious grounds. Besides, they have practised another tactics. The sugar manufactured in India is usually of a peculiar colour and consistency, which is quite distinct from sugar which hitherto came to India from outside. Therefore it is usually possible to distinguish the Swadeshi article from the foreign article. The sugar manufacturers in Java soon saw this point and they have begun to export a stuff which very much resembles the Swadeshi sugar. So that the Javanese sugar serves a double purpose in India. People who object to foreign sugar because it is contaminated accept this sugar because it conforms with their standard of purity, whereas to those people who do not want foreign sugar on economic grounds this sugar is palmed off as Swadeshi sugar by unscrupulous merchants. On this account during recent years imports of sugar from Java have become simply appalling. The following figures tell this story very vividly :—

Year.	Tons of sugar from Java.
1890-91	4090
1891-92	5278
1892-93	4095

Year.	Tons of sugar from Java.
1893-94	5085
1894-95	7692
1895-96	5595
1896-97	5085
1897-98	5614
1898-99	8277
1899-1900	12862
1900-01	17935
1901-02	22395
1902-03	30290
1903-04	72516
1904-05	96622
1905-06	87746
1906-07	149929
1907-08	319251
1908-09	312662
1909-10	390576

This clearly shows how fast Java is taking hold of the Indian Sugar Market.

When the counterveiling duties on European bounty fed sugar coming to India were imposed and soon after when the bounties were abolished altogether it was thought that this would bring some relief to Indian Sugar Industry, because it was thought that the prices of sugar which were depressed would come to the normal position and at the normal price the Indian Sugar Industry would be able to hold its own at least in home market. But the following figures tell quite a different story. The Swadeshi movement was also expected to reduce the quantity of sugar being dumped into India. The following figures give the imports of sugar in cwts. for 8 years since the advent of the Swadeshi campaign in 1904:—

	1904—05	1905—06	1906—07	1907—08	1908—09	1909—10	1910—11	1911—12.
<i>Cane—</i>								
Mauritius	1,823,826	2,013,632	2,310,177	2,600,193	2,514,440	2,435,560	2,923,983	1,709,773
Reunion	21,974	35,269	109,090	23,587	19,505	...	...	...
China	35,400	27,731	5,423	7,340	6,384	22,095	129,363	12,656
Java	2,546,066	2,007,449	3,467,356	6,593,669	6,172,039	7,815,015	8,758,723	8,160,468
Strait Settlements	44,886	10,107	6,132	11,787	804	3,113	954	767
Other Countries	362,157	168,741	28,668	14,265	6,087	1,114	1,164	4,030
<i>Beet—</i>								
Austria-Hungary	1,505,345	2,453,733	2,016,803	730,265	1,918,158	782,773	714,097	241,433
Germany	151,126	630,416	1,557,679	51,879	3,071	51,538	8,211	9,812
Belgium	7,023	122,445	104,104	1,312	988	1,474	1,142	1,599
France	40,806	224,443	23,826	9,782	472	306	444	241
Other Countries	12,118	2,225	1,422	832	21,335	23,096	1,064	1,053
<i>Total Sugar—(excluding molasses and confectionary).</i>	6,549,797	7,696,191	9,730,682	10,044,901	10,663,283	11,136,084	12,539,145	10,141,832

This clearly shows that in spite of large area under sugar cane, in spite of cheap labour, in spite of the advantages of home market, in spite of the Swadeshi movement at present Indian sugar cannot compete with foreign sugar.

Why can we not compete with Foreign Sugar ?

Various answers to this question have been advanced by persons having more or less acquaintance with the conditions in India. Some say that such a miserable cane is being grown in India, that our industry will never survive unless we throw out our present varieties of cane and introduce new and better varieties from other sugar-growing countries. Now let us scan this argument. Most of the cane varieties grown in India at present contain 12-13% Sucrose. Let us see what is the condition in other countries. Here are the average Sucrose contents of canes grown in different countries as far as I have been able to get information :—

	Sucrose in Cane.	Fibre in cane.
Mauritius	... 13-14%	10-12%
Java	... 12-13%	12-13%
British Guiana	... 12%	13%
Trinidad	... 12-12½%	12-13%
Barbados	... 13-14%	?
Antigua	... 14-15%	15-16%
St. Kitts	... 13-14%	12-13%
Cuba	... 12-13½%	10-11%
Lousiana	... 10-11%	10-11%
Hawaii	... 15-16%	10-11%
Egypt	... 12-12.51%	10-11%

This shows that Sucrose content of the canes in India is in no way behind that in the majority of the other countries. If we can improve the Sucrose in cane in India so much the better. But the above figures show that the low Sucrose content is not the cause of our trouble. Our most important competitors at present *viz.*, Mauritius and Java have no better cane than we

have in India. Some point to the miserable outturn of our canes per acre in India. Excluding Punjab, where the climate is extremely unsuitable for growing cane, the average outturn per acre of cane is nowhere below 15 tons. In Bombay and Madras the average outturn is more than 30 tons per acre. Amongst other countries Hawaii, Java and Porto Rico only have outturns of more than 30 tons per acre. Majority of the cane producing countries give an outturn of 20-30 tons per acre. In Trinidad the outturn is below 25 tons while in Antigua it is as low as 12-15 tons. Besides anybody who is acquainted with the agricultural conditions in India, can see that higher outturns are always accompanied by higher cost of cultivation manuring and irrigation ; and it can safely be said that whatever be the outturn, the cost of growing cane per ton remains practically the same. In Bombay Presidency, crops of 35 tons and more per acre are obtained, and the cost of cultivation is not less than Rs. 300. So that the cost amounts to about Rs. $8\frac{3}{4}$ per ton, whereas in United Provinces where the average crop is 15 tons, the cost of cultivation is never higher than Rs. 100, which is equivalent to Rs. $6\frac{2}{3}$ per ton. This shows that with increased outturn the proportionate cost of growing cane per ton does not decrease. Hence whether there is a high yield or low yield of cane per acre, it will not materially affect the cost of sugar. Of course with an increased outturn per acre we shall have more sugar produced in India, but it will not bring down the expenses per ton.

The various agricultural departments in India are striving to improve the quality and quantity of cane. No doubt it is a very laudable object, and any improvement in that direction will mean a distant gain. But as I have shown above, we cannot expect any results which will cause a revolution in that respect.

The agricultural departments in various other countries are working in that line and some of their efforts have achieved success to a certain extent. But it is a patent fact that up to this time no revolutionary change has been made in any sugar

country. The case of sugar beet is often mentioned as showing the power of scientific and experimental agriculture. The sugar beet which originally contained less than 8% Sucrose has now been made to yield 16 and more Sucrose. Similar attempts have been made and are repeatedly being made in the case of sugarcane. When the discovery of the fertility of sugarcane seed was made a series of speculations followed about the possibilities of getting or building up a cane variety yielding 20% Sucrose so as to outshine the sugar beet. Fortunately the scientists actually connected with the new seedling cane experiments did not much indulge in these wild speculations. They soon realized that though improvements in the sugarcane were possible in several directions, the improvement in the Sucrose contents cannot be very startling and if it shows an advance in one place the same might not be the case in another place. In Java various eminent scientists have been working with sugarcane varieties for the last 30 years or more, and the Javanese sugar industry owes no small debt of gratitude to them. But the main result of their work appears to be to maintain a certain standard. The original Cheribon cane used to yield 30-35 tons of cane per acre, and contained 13-13.5% Sucrose. When that variety broke down, with a patient laborious research work they were able to create some new varieties which yielded 40 tons of cane and contained 12-13% Sucrose. So that the amount of Sucrose obtained per acre was practically the same, and what they were able to do really was to maintain a certain standard of net yield per acre. Of course even this maintenance of the standard was no small thing because otherwise the ruin of Javanese sugar industry was threatened.

The same is the experience in the West Indies. The conditions of these Islands and of Java have been exactly identical. Both were threatened by the same sort of difficulty, in both places eminent scientists have worked on the same lines and in both places they have achieved practically the same result, *viz.*, maintenance of a certain standard. In the West Indies each Island has a certain definite standard of the yield per acre and

the Sucrose contents of cane. When "Bourbon" variety broke down, "White Transparent" was substituted for it and it maintained the original standard of Bourbon. White Transparent broke down in its turn and the seedling canes which have taken its place have again maintained the same standard. Of course in the experimental trials the new introductions show a distinct improvement as compared to a broken down, crippled, old variety and some varieties have shown some real improvement, but on the whole the effect is that a certain standard has been kept up and actual net improvement is comparatively small.

By these arguments I do not mean in the least to deprecate the work achieved in Java and the West Indies. On the contrary this work is a great triumph in scientific agriculture and without this work these places would have been in ruins by this time. But still the fact remains that what has actually been done is the maintenance of a certain standard and as regards actual advance either in Sucrose contents of cane or outturn per acre it is comparatively small. The net outturns in the shape of Sucrose per acre has been kept up, but have not materially increased. The whole point of my argument is that as regards the raw material we are not very far behind the world and though no doubt there is a scope for improvement both as regards the quality and quantity of cane, the advance in this direction will not be sufficient to materially affect the position of sugar industry in India.

Even suppose the land is made to supply more cane and the cane is made to supply more sugar and if this extra sugar is burnt up afterwards in the shape of megass and tobacco cured with rich molasses wherein lies the advantage? Even now are we recovering even half the sugar furnished by land? Let us examine the actual conditions. At present there are four systems of manufacturing sugar in India :—

- (1) The Old Khandsari System.
- (2) The Hadi System.

(3) Gul Refining System.

(4) Vacuum Pan Factory System.

Out of these at present the first and third are more extensively used and the second and fourth have been employed to a less extent. Let us examine the recoveries of sugar obtained by these different systems. For the sake of comparison suppose the raw material contains 13% Sucrose and 15% fibre and that by ordinary bullock mills such a cane yields 60% juice containing 16% Sucrose and having 86 purity, and that by a five roller power driven mill it yields 65% juice containing practically the same percentage of Sucrose and a purity of say 85.

(1) *The Khandsari System* :—In this system the cane is invariably crushed by bullock driven mills which yield say 60% juice in cane. This is boiled down on open fire to form a massecuite the percentage of which to cane comes to about 11%. This is cured with sewâr. In this way 33% of the massecuite is obtained as sugar, and the rest is molasses. Hence the percentage of sugar on cane is 3.66%.

(2) *The Hadi System* is an improvement on the above as regards curing. The improvements of this system in clarification and evaporation give a somewhat better quality but the percentage of massecuite is not affected. In this system the massecuite is cured in small hand driven centrifugals. Thus a recovery of 45% is obtained on massecuite. The rest is molasses. This recovery amounts to 4.95% on cane.

(3) *The Gul Refinery Process* :—In this process Gul is manufactured on a small scale by bullock mills and open fire-pans. The recovery of the Gul on cane is 10.5%. From this Gul the refineries as an average obtain a recovery of 55% and the rest is molasses. Therefore the recovery of sugar on cane amounts to 5.77%.

(4) *The Vacuum Pan Factory Process* :—There are only a few factories in India making sugar directly from cane and none of them have published any results. But Mr. Hirst

has published some figures in the "International Sugar Journal", about one factory whose name he has not mentioned which requires more or less 15 tons of cane to a ton of sugar. At this rate the recovery per cent on cane amounts to 6.66%. At the last Allahabad Exhibition Messrs. Blair, Campbell and McLean had exhibited and demonstrated a model factory with vacuum pan which, according to their ideas, would suit the Indian conditions best, and it appears to have been upheld by the Agricultural Department of the United Province. Though the size they exhibited is smaller than the so-called central factories at present working in India, yet the results that have been shown at the exhibition give a fairly correct idea about the capabilities of such factories. There with a 5 roller mill they obtained 65% of juice on cane containing 16.29% Sucrose. Out of this Sucrose 65% was recovered as sugar. Therefore from these figures the recovery of sugar on cane amounts to about 6.89%. This figure quite agrees with the figure given above.

Now let us see what is the position in Java and Mauritius in this respect. Here are the average results of 126 Javanese factories and 24 Mauritius factories which are represented in the "Mutual Control" and whose results are published annually.

Java (1909). Mauritius (1910).

Sucrose in cane per cent ...	12.30	13.75
Sucrose extracted in		
juice % cane ...	11.15	12.37
" " % Sucrose		
in cane ...	90.67	90.00
Sugar made % cane ...	10.06	10.84
" " % Sucrose		
in cane ...	81.79	78.80
" " % in juice ...	90.23	87.30

All these did not make white sugar. Some made white sugar only, some made raw sugar only, while many made partly white sugar. I could not separate factories making white sugar. When making only white sugar the Sucrose extracted in juice % Sucrose in cane will remain the same but the recovery of sugar % Sucrose in juice would be somewhat lower, about 85%.

This thing clearly shows that in modern factories by modern methods it is quite possible to recover 90% of the Sucrose in cane as juice and 85% of the Sucrose in juice as white sugar. At this rate the Indian cane containing 13% Sucrose ought to yield 9.33% white sugar on cane.

When we compare with this the present percentage of recovery we can easily see why we cannot compete with the foreign article in spite of our advantage in cheap labour and in spite of the heavy freight charges which the foreign article has to bear.

		Sugar per cent of cane.	Tons cane to a ton of sugar.
I.	Old Khandsari System	... 3.66%	27.3
II.	Hadi System ... ..	... 4.95%	20.2
III.	Gul Refining System ...	... 5.77%	17.4
IV.	Small Vacuum Pan Factory in India ... ..	... 6.66%	15.0
V.	Modern Factory System in other countries ...	... 9.36%	10.6

Practically half of the sugar which other countries are recovering we are burning in furnaces in the shape of half crushed megass or in the hukkās in the shape of rich molasses used for curing tobacco, and still we complain that we cannot compete with the foreign stuff and that our canes are bad and that our outturns in the fields are miserable !

Cost of Manufacture by Different Systems.

One is likely to ask what about the manufacturing expenses. The present systems might be very inefficient in recovery but if by modern methods the cost of manufacture is very heavy it will counter balance the advantages in recovery. It is therefore necessary to see the economic aspect of the case.

At the outset I must admit that I have got very few actual figures about the manufacturing expenses by the present systems followed in India. Fairly accurate estimates are available but it must not be forgotten that the Old Khandsari System and to a large extent also the Hadi System are essentially based on cottage industry principle. Their main idea is to incur very little capital expenditure and to curtail supervision and labour expenses by the owner working for himself. This fact will have some influence in the actual economies of the process. Yet at the same time it must not be forgotten that the credit of the men engaged in these cottage industries is small and therefore whatever capital they required has to bear a heavy rate of interest whereas men working on a large scale can get money at a cheaper rate.

The Khandsari System :—It is extremely difficult to estimate the cost of manufacture by this system because of the complications in work. The work is usually done in two stages. The owner of the “ bel ” purchases cane or juice and prepares the “ rab ”. This rab is purchased by the Khandsari and cured by means of *sewâr*. So that the sugar put on the market has to bear profit made by the cane cultivator, rab manufacturer, rab curer, and the retail merchant. Khan Bahadur S. M. Hadi has published in his book “ Sugar Industry in the U. P. ” detailed figures about the cost of manufacture by this system. But the complexity stated above makes it very difficult to arrive at a figure showing net cost of manufacture per ton of sugar exclusive of the cost of cane and after allowing for the price obtained for molasses. As far as I can make out from figures given by him this net cost

comes to Rs. 56 per ton of sugar. This does not include any interest charge. But as in the process of refining by *sewâr* the *rab* remains under manufacture for about 3 months and as comparatively a large amount of money is locked up in the shape of this *rab*, the interest charges must be considerable. On the whole I am inclined to think that the actual cost of manufacture (including the interest charges but not including the cost of cane and after allowing for the price of molasses realized) by this process cannot be less than Rs. 70 per ton of sugar.

The Hadi System :—The original idea of Mr. Hadi was to improve the above system and yet to preserve the cottage industry scale. Hence originally he advocated the use of hand driven centrifugals for working. But soon he found out that this did not secure a distinct advantage over the old system and to economise the expenses he advocated the use of steam driven centrifugals, but kept the system of manufacturing *rab* the same. He has published elaborate figures about the working expenses on both these scales. Calculating from these figures we get the net cost of manufacture per ton of sugar (after allowing for the value of molasses obtained) to be Rs. 67 when working on a small scale and Rs. 56 when working on a large scale.

The Gul Refining System :—I have no direct figures to calculate the expenses of manufacture by this system but as far as I have been able to judge about Rs. 25 per ton of *gul* melted would represent a fair estimate. But before calculating this to per ton of sugar, in order to get comparative figures to show cost of manufacturing per ton of sugar starting from cane we shall have to add to this amount the cost of *gul* making and transport of *gul* to the factory. Here also in the absence of any actual data I have to depend upon guess work. But I think it will not be very wide of the mark if we take this figure at Rs. 35 per ton of *gul*, i. e., total cost of manufacture of sugar per ton of *gul* melted at Rs. 60. This calculating on sugar at 55% of *gul* and after allowing for the price of molasses obtained we

get a net cost of manufacture per ton of sugar as Rs. 60 exclusive of the cost of cane used originally in gul making.

Small Vacuum Pan Factory System:—This system has been advocated from time to time in India and a few factories have been worked on this line but no reliable data about the manufacturing expenses have been available. Mr. Burt has published such data as obtained under actual working conditions from the factory exhibited by Messrs. Blair, Campbell and McLean at the last Allahabad Exhibition. From these figures the cost of manufacture per ton of sugar comes to Rs. 81 exclusive of the cost of cane and after allowing for the price of molasses obtained.

The figures given by Mr. Burt are open to serious objections. In the first place under supervision charges no provision is made for engineer. Under the "Boilers Act" a certified engineer will be necessary and even for the size of the factory under consideration he will be second class certificate holder and his pay will not be less than Rs. 100 per month for a season of three months only. Then again it has been assumed that the factory will be able to get men like manager and skilled workmen at the pay stated even when working for three months in a year. It is very difficult to believe that a man will come forward to act as manager and pan boiler combined on a salary of Rs. 1050 per year. But Mr. Burt and Messrs. Blair, Campbell and McLean expect an European to work on this pay. No provision has been made for expenses incurred at the beginning or end of the season. Evidently every person including the manager is expected to come to the factory on the day the factory starts crushing cane and is expected to leave the factory as soon as the last cane enters the mill. No provision is made for any cost of transport of cane to the

factory. Cane growers in the United Province usually offer cane at a price which includes harvesting and carrying to the mill. But this is in the case of small mills which are not situated very far from the field. In the case of a factory of even such a small size as under consideration some transport charge will have to be incurred by the factory. The allowance for contingencies, which evidently include stores, such as lime and other things used in defecation, lubrication oil and other engineering stores, is Rs. 100 per month which is exceedingly low.

In the capital expenditure account the cost of machinery (including staging) is stated to be Rs. 36,000. As there is no other item for freight charges on this I take it that the above sum of Rs. 36,000 includes freight on machinery from England to United Province. At this rate the machinery which includes a five roller mill, defecation plant, a vacuum pan with dry air pump and centrifugal etc., is exceedingly cheap, cheaper than what I should expect to get anywhere. But as this figure is given authoritatively I take it that Messrs. Blair, Campbell and McLean are prepared to supply all this machinery, pay freight charges to United Province and pay the import duty of 5% and all this in Rs. 36,000.

Even accepting this figure the discrepancies pointed out should increase the working expenses to a considerable extent. But there is another discrepancy on the credit side. It is stated that with about 3,200 mds. of sugar, about 1,000 mds. of molasses are available. But evidently here is a serious slip. The amount of molasses cannot be less than 2,000 mds. After allowing for this but adding the additional expenditure as stated above the net cost of manufacture per ton of sugar cannot be less than Rs. 90.

Modern Size Factory:—I have not been able to get the cost of manufacture in a modern white sugar factory. Some figures from Java are available. But as the Javanese factory is coupled with a cane estate the actual manufacturing expenses cannot be separately stated with any accuracy. In the accompanying statements I have gathered figures from several West Indian Factories. From these we see that the average cost of manufacture in the Antigua factory (average of six years work) is Rs. 53-11-11 per ton of sugar. This includes all the factory expenses, including cost of transport of cane, interest on working capital &c. The average manufacturing expenses of six factories in Trinidad come to Rs. 56-1-5 per ton of sugar. The Antigua factory made raw sugar only. Some of the Trinidad factories made partly “Yellow Crystal” sugar and partly raw sugar. For making white sugar the expenses would be somewhat higher. But this higher cost of making white sugar will be counterbalanced by the cheap cost of labour in India.

In the Antigua and Trinidad factories the rate of wages of ordinary labourers varies from as. 12 to Re. 1-4 per day. In India the rate of wages is as. 3 to as. 5 per day according to locality. This shows that with the cheap rate of wages the manufacturing expenses of white sugar factories in India ought not to go above Rs. 60 per ton of sugar.

That this is not a low estimate can be further seen from the manufacturing expenses incurred by the Australian factories. In the accompanying table I have gathered figures about four Australian factories. These figures refer to the period when these factories were under Government management and all the expenses were carefully noted. In Australia the rate of wages is exceptionally high. In these factories it was approximately as. 6 per hour *i. e.* Rs. 3 per day of 8 hours besides rations. And yet the average cost of manufacture including transport &c. was Rs. 64-13-6 per ton of sugar. This is calculated to 94° N. T. sugar *i. e.*, very high grade nearly white sugar. This shows that with good management the cost of making white sugar by modern factories ought not to exceed Rs. 60 in India.

Financial Results of Some Factories in Trinidad working on Mixed Central System.

	I 1909		I 1911		II 1909		III 1909		IV 1909		V 1909		VI 1909		Average.	
	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.
Factory charges including transport per ton of cane	4	10 0	6	1 8	3	13 0	4	11 8	6	4 6	4	0 11	5	0 11	4	15 2
Cost of cane per ton	8	12 6	7	0 0	7	0 1	10	6 0	10	11 4	8	12 11	10	5 6	9	0 1
Total expenses per ton of cane ...	13	6 6	13	1 8	10	13 1	15	1 8	16	15 10	12	13 6	15	6 5	13	15 3
Tons of cane to a ton of sugar ...	12	01	11	72	11	68	10	92	9	54	12	02	11	72	11	37
Manufacturing expenses per ton of sugar	55	9 0	71	8 6	44	15 3	51	10 0	59	15 0	49	12 0	59	4 0	56	1 5
Cost of cane per ton of sugar ...	105	7 0	80	5 0	18	13 9	113	5 0	102	2 0	105	13 6	121	3 0	102	9 4
Total cost per ton of sugar ...	161	0 0	151	13 6	126	13 0	164	15 0	162	1 0	155	9 6	180	7 0	158	10 9

*Itemized statement of the cost of production of sugar in some
Queensland factories.*

(From the Report of the Comptroller of Central Factories.
Season 1908 calculated on basis '88° N. T.)

Item per ton of sugar.	Gin. Gin.		Mt. Bouple.		Nerang.		Proserpine.	
	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.
Cost of cane	74	3 0	75	10 0	67	8 0	83	12 0
Transport of cane	4	9 0	3	1 0	12	15 0	1	9 0
Labour	12	2 0	19	2 0	20	8 0	16	10 0
Salaries (in season)	1	11 0	1	5 0	3	8 0	1	11 0
„ (off season)	2	5 0	4	2 0	5	5 0	2	4 0
Firewood consumed	3	6 0	4	4 0	6	8 0	2	4 0
Mill supplies	2	1 0	3	4 0	5	15 0	1	10 0
Laboratory and Chemist	0	6 0	0	11 0	1	11 0	0	7 0
Railage &c. on sugar	5	15 0	2	12 0	1	1 0	1	1 0
Office expenses	0	4 0	1	2 0	1	5 0	0	8 0
Insurance	0	8 0	0	12 0	1	3 0	0	9 0
General expenses	1	1 0	1	8 0	1	15 0	1	14 0
Maintenance	11	1 0	7	13 0	7	1 0	6	7 0
Renewals	3	15 0	8	12 0	5	12 0	4	1 0
Total cost of Production	123	7 0	134	2 0	142	8 0	124	15 0
Do on basis 94° N. T.	131	14 0	143	4 0	151	14 0	133	7 0
Manufacturing expenses inclusive of transport but excluding cost of cane on 94° N. T. basis	57	11 0	67	10 0	84	6 0	49	11 0
Approximate crushing capacity per hour tons cane.	18		35		10		20	

Financial Results of the Antigua Central Sugar Factory.

	1905	1906	1907	1908	1909	1910	Average.
Per ton of Sugar							
Factory charges	Rs. A. P. 37 8 0	Rs. A. P. 36 3 0	Rs. A. P. 31 9 0	Rs. A. P. 32 9 0	Rs. A. P. 38 13 0	Rs. A. P. 39 0 0	Rs. A. P. 35 15 1
Railway Transport	3 6 0	8 3 0	7 3 0	8 11 0	6 12 6	7 14 6	7 0 4
Administration charges	6 6 0	3 9 0	2 2 0	2 6 0	2 7 3	3 2 6	3 4 5½
Interest &c.	12 4 0	9 6 0	5 2 0	5 11 0	6 14 0	5 11 3	7 ½
Total Manufacturing expenses per ton of sugar	59 2 0	57 5 0	46 0 0	49 5 0	54 14 9	55 12 9	53 11 11
Tons of cane to a ton of sugar	9.70	10.51	9.64	9.17	9.26	8.95	9.54
Manufacturing expenses per ton of cane	6 1 6	5 7 8	4 12 4	5 6 7	5 14 11	6 3 8	5 10 5

As in previous cases this cost will have to be calculated to net cost after allowing for the price of molasses realized. In a modern sugar factory with average cane the quantity of final molasses amounts to $\frac{2}{3}$ to $\frac{1}{2}$ ton per ton of sugar. This much molasses will realize Rs. 20 at the lowest price for molasses. Therefore the net cost of manufacture comes to Rs. 40 per ton of sugar.

From this it will be seen that the cost of manufacture is lowest in modern sugar factories. But as these factories require far less cane per ton of sugar than any other process at present followed or advocated in India the results become still more striking. In the following table I have gathered up, for comparison, figures of net cost of manufacturing a ton of sugar by different processes. For the sake of comparison I have adopted the price of cane (As. 4 per md. or Rs. 7 per ton) on which Mr. Burt's figures about the small vacuum pan factory are based.

Process.	Tons of cane to a ton of sugar.	Cost of cane per ton of sugar.	Net manufacturing expenses.	Total net cost per ton of sugar.
Khandsari ...	27·3	191	70	261
Hadi ...	20·2	141	56	197
Gul Refining ...	17·4	122	60	182
Small Vacuum pan ...	15·0	105	99	195
Modern Factory ...	10·6	74	40	114

Possibility of Sugar Industry in Different Provinces.

From the foregoing we have seen that, provided there is sufficient sugar-cane supply at a reasonable rate available for a modern type Sugar Factory there is no difficulty in producing sugar in India at a sufficiently low cost to compete with any foreign

sugar. But a modern type sugar factory is not an easy affair to organise. The economical size of modern type sugar factory requires 300 to 1,500 tons of cane per day. To start a medium size factory of say 300 tons of cane per day we require at least 50,000 tons of cane in a season. In a Province like the United Provinces where the outturn of cane per acre is necessarily very low (on account of climatic and other conditions) this much cane represents an area of about 3,300 acres. In order to avoid excessive transport charges this much area must be within 35 square miles so that the mean distance of transport will not much exceed 5 miles. This thing is only possible on big irrigation canals as are to be found in the United Provinces.

Half of the total acreage under cane in India is in the United Provinces, where we have the huge irrigation systems fed by Ganges and Jamna. In that province in districts like Meerut, Bareilly, etc., in many places the sugarcane area is sufficiently compact and large to justify the establishment of large modern type factories. There the cultivators are accustomed to selling their cane. The quality of cane is somewhat poor but considering the rate at which the cane can be purchased *viz.*, Rs. 7 to 8 per ton, a properly designed and properly managed factory ought to succeed there exceedingly well, especially because the local sugar has enormous advantage over the foreign sugar on account of the heavy railway freight charges which the foreign sugar has to bear in coming from the sea port to this province.

As regards area under cane next to the United Provinces is Bengal. Here also the cane is only of a moderate quality, and in some parts it is reported to be poor. The cane area is not very compact, therefore, there is not much scope for very big factories. But I believe several good localities can be found to start moderate size factories of daily crushing capacities varying from 300 to 500 tons of cane a day. Several factories, big and small, have been started in this province; some are still working more or less successfully and some have failed with disastrous results. But as far as I

have been able to gather, these failures are due mostly to faulty design and mismanagement. This province being near the sea coast, the local sugar industry has to face a keener competition with foreign sugar, especially from Java. On this account the sugar industry here cannot be a lucrative business unless the factories are properly designed and economically managed.

Punjab stands third in area under cane. On account of very cold autumn and winter Punjab is not a good locality for sugarcane. Here the cane is of very bad quality and the outturn is exceedingly poor. But in this province there are exceedingly good irrigaton facilities and as this province is far removed from sea coast, the foreign sugar has to bear very heavy freight charges. These are the reasons why people there are so much after sugar cane cultivation in spite of the cold climate. This cold climate which is so inimical to sugarcane might prove to be very well suited for sugar beet. But as far as sugarcane is concerned I am not sure how far it will be possible to successfully work modern type factories there.

Next to Punjab, Behar is a very important sugarcane centre. Here the position is very similar to Bengal, and here is quite a good scope for moderate size modern factories.

The other two important sugarcane centres are Madras and Bombay. Considering the total acreage under cane in India the acreage in these two provinces appears insignificant. Roughly Madras has 60,000 acres and Bombay has 80,000 acres under cane as against 1, 000,000 acres in the United Provinces. But as regards actual magnitude of the industry these provinces stand on an entirely different footing. In the first place the average outturn of cane is nearly three times that in the United Provinces. The market conditions in these provinces are also different. In the United Provinces sugarcane is grown primarily for making some kind of dry sugar. Gul is also made in that province but considerable portion of it is used by refineries and ultimately converted into sugar. In Madras and Bombay Presidencies practically all the sugarcane is grown

for making Gul only, and this Gul is intended for direct consumption. There are several refineries in Madras and Mysore but they use mostly palm Gul and very little cane Gul. In both these provinces the cane is of a very superior quality, the climate and soil being admirable for growing sugarcane. But here the sugarcane is grown under intensive cultivation with heavy manuring, so that the cost of cultivation per ton of output is very heavy, much more than in most other places. Both these provinces being on the sea coast the foreign sugar is not at such a disadvantage as regards freight as it is in the United Provinces. The demand for Gul is not only steady but at present it is greater than the supply, so that, especially in Bombay Presidency, the prices of Gul are very firm and sometimes the rate of Gul becomes as high as foreign refined sugar. Under these circumstances not only the use of sugarcane Gul for refining is absolutely out of question but at present it pays better to make Gul than to make sugar. As I have said above, the demand for Gul is steady so that at present there is more profit in Gul making. Of course with increased area under sugarcane and therefore with increased output of Gul the conditions will change. At present there is not much prospect of there being any material increase of sugarcane area in Madras. In Bombay at present several huge irrigation systems are being completed. With these new irrigation facilities the sugarcane area in the Bombay Presidency is bound to increase by about 30,000 acres in the next ten years. But till that time it is better to concentrate the efforts in improving the Gul industry by employing better methods and by introducing the Central Factory System. This procedure will give not only better Gul at less cost but it will pave way to future sugar factories which are bound to come as soon as the area under cane is increased by the new irrigation facilities.

Indian Sugar Tariff.

From the foregoing it will be seen that prospects of sugar industry in India are very hopeful provided we work earnestly

on modern lines. But modern type sugar factories cannot be started in a day. It will probably be several years before we have a decent number of modern type factories. The demand for sugar in India is increasing every year by about 5,000 tons. Therefore for a good many years to come we shall have to import sugar from outside to the extent of more than half a million tons per year. Now the question is why should we import all the sugar in a refined form. Why should we not import raw sugar and refine it here as most other countries do? Anyhow we shall have to import sugar from outside for several years to come. But if we import this sugar in raw state and refine it here we shall derive at least some profit. Such a procedure will enable us to work at least 50 refineries which will be placed on the sea coast provinces like Bombay, Madras and Bengal.

Now sugar producing countries which import large quantities of sugar, *e. g.* Great Britain derives a handsome profit in this refining business. We might be able to do the same provided the Government are prepared to give one concession to the Indian sugar refineries. The position of market rates of raw and refined sugar is such that without Government help this refining business cannot be carried on. The difference in the price of raw sugar and refined sugar is usually so small that it is barely sufficient to pay the working expenses of the refinery. The refiner's profit is derived from the difference in the duty on raw and refined sugar. In Great Britain this difference amounts to one shilling per cwt. *i. e.* Rs. 15 per ton.

Unless we have such difference in the duty on raw and refined sugar, the sugar refining business cannot be successfully carried on. At present the import tariff of sugar is very peculiarly arranged. There is no uniformity. It is 5% *ad-valorem* in name but sugars from Mauritius and Java pay different rates, because the prices on which the duty is to be based is fixed arbitrarily. Though the difference is slight yet it is anomalous. Then there is no difference in the duty on raw sugar *i. e.* sugar below 16 D. S. and that on refined sugar *i. e.*

sugar of 16 D. S. and above. The slight difference in the prices of these two kinds of sugars makes a corresponding slight difference but it is negligible. The more equitable arrangement would be to make the duty on sugar a specific duty instead of *ad valorem* as it is at present, and there should be a distinct difference between the duty on sugar below 16 D. S. and that of 16 D. S. and above. In my opinion the duty on low grade or raw sugar below 16 D. S. should be as. 4 per cwt. while that on refined sugar of 16 D. S. and above should be as. 12 per cwt. At usual market rates this scale of duty amounts to 3% on raw sugar and $7\frac{1}{2}\%$ on refined sugar. Such an arrangement will not be any burden on the taxpayer, it will bring the same revenue to the Government as it does at present and it will yield a profit of Rs. 10 per ton to the refiner in India working with imported raw sugar.

I earnestly hope that this Conference will bring this matter to the notice of the Government.

THE LAW OF TRADE-MARK IN BRITISH INDIA.

BY

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In India there is no system of registration of Trade-mark and there is no provision for a statutory title to it. As a rule the person who first used the trade-mark would be considered the proper person entitled to use it except under special circumstances. The registration in England of a trade-mark used in India is useful as it affords some proof of user and ownership. Beyond the provisions contained in Sections 478 to 489, I. P. C. which deal with the punishment for fraudulent user of trade or property mark, there is no statute law in India for the acquisition, preservation, assignment and extinction of trade-marks. The Indian Merchandise Marks Act, IV of 1889, as subsequently amended, has recast the above sections of the Penal Code and the provisions of the Sea Customs Act 1878, relating to the prohibition of importation into British India of goods bearing false description or marks and the Act provides for trade descriptions as well.

A trade-mark is defined therein as a mark used for denoting that goods are the manufacture or merchandise of a particular person and the definition is made to include marks protected by the English Patents, Designs and Trade-marks Act, 1883, (46 & 47 Vic. Ch. 57), and any trade-mark which either, with or without registration, is protected by any law in any British possession or Foreign State to which S. 103 thereof applies. The above English Statute has itself been amended by the Act of 1888 ; and the New English Trade-Marks Regis-

tration Act of 1905 repeals sections 85 to 99, 101, 102, 105, 108, 211 to 217 thereof. In England a separate Act was subsequently enacted in 1907 to regulate the law relating to Patents and Designs, (7 Edw. 7).

A 'Property-Mark' is one which denotes that moveable property belongs to a particular person, whereas 'trade descriptions' mean any description regarding the number, quantity, weight or measure of any article, the time or place of its origin, the method of its manufacture, or its component materials. The mark used generally are numerals as an indication of the above matters. The Penal Code punishes the using of a false trade-mark, the counterfeiting of a trade-mark used by another or by a public servant, the making or possessing of instruments for counterfeiting a trade-mark, the selling of goods with a counterfeit trade-mark, or the using of false marks upon a receptacle containing goods so as to make others believe that it contains goods of another description. The cases decided under the Penal Code are detailed under the heading 'Remedies' *infra*.

In the absence of any law in British India the rights and liabilities of the parties have to be determined in accordance with the principles of the English Common Law. Declaration before a Magistrate or entry in the office of the Chambers of Commerce of the various Presidencies does of course give some publicity to the origin and owner of the mark, but it cannot protect the mark from infringement nor can it confer any title as in the case of registration by the Registrar in England, who is subject to the superintendence of the Board of Trade, a statutory body constituted by Act of Parliament.

The Case Law in India on the subject of Trade-mark is few and far between and it is proposed to set out briefly the development of the law in this country. For convenience the subject will be considered under the following headings :—(1) What is Trade-mark and the Mode of acquiring the same; (2) Assignment and Transfer of Trade-mark; and (3) Infringement and

Remedies therefor. In passing, the English Case and Statute Law will be referred to briefly to show how far the Law of Trade-mark has advanced in England.

A '*trade-mark*' must be distinguished from '*a patent*' and '*copyright*'. In the case of '*trade-mark*' any man can manufacture the article sold. The only right which the owner has is to say, "Don't sell any goods under my mark" and the owner cannot claim damages to every article manufactured under that mark. The property and right to protection is in the device or symbol invented and adopted to designate the goods to be sold and not in the article which is manufactured and sold. In the case of '*a patent*' every sale without license is considered as causing damage to the patentee. The public are prohibited from manufacturing any patented article during the existence of the patent though they are at perfectly liberty to manufacture any unpatented article according to the identical original process, whether the original maker uses or does not use a trade-mark upon his goods. '*Copyright*' though relating to the substance of an article like a patent has reference to a literary instead of a material production; whereas trade-mark does not protect imitation of substance but identifies the source of the article.

1. What is trade-mark and acquisition thereof.

A Trade-mark means a mark used to denote that goods are the manufacture or merchandise of a particular individual. To give a right of action it must be established that the mark in respect of which a person makes his claim has acquired a reputation in connection with the goods he sells. A vendor of goods though not the manufacturer can have property by way of trade-mark; (See *Munna Lal*

L. R., R., 37 Cal. 204, (1910).

Serowjee). Protection is given to trade-mark because it is property. The general principle upon which Courts exercise jurisdiction in the case of trade-marks is that " a manufacturer who produces an article which he announces as one of public utility and who places upon it a mark by which

it is distinguished from all other articles of a similar kind, with the intention that it may be known to be of his manufacture, becomes the exclusive owner of that which is henceforth called his trade-mark. The property thus acquired by the manufacturer, like all other property is under the protection of the law, and for the invasion of the right of the owner of such property the law affords a remedy similar in all respects to that by which the possession and enjoyment of all property is secured to the owner ; (*per Bacon V. C. in 51 L. J. Ch.* 897). The function of a trade-mark is to give the purchaser a satisfactory assurance of the mark and quality of the article he is buying.

Under the English Law for a trade-mark to be protected it must be registered, with the single exception that a proprietor can by obtaining a certificate of refusal protect a mark which was in use before 13th August 1875, (the date of the First Trade-Mark Registration Act). Trade-marks in English Law may be classified under three sub-divisions : (1) Registrable trade-marks, (2) Non-registrable trade-marks used before 13th August 1875 and (3) Non-registrable trade-marks not used before that time, which can only be protected in a passing off action equally available to marks in sub-divisions (1) and (2) which have not been registered or tendered for registration.

According to the definition given in the English Act of 1905, s. 3, a 'trade-mark' means a *device, brand, heading, label, ticket, name, signature, word, letter, numeral or any combination thereof* used or proposed to be used upon or in connection with goods for the purpose of *indicating* that they are the goods of the proprietor of such trade-mark by virtue of manufacture, selection, certification, dealing with or offering for sale. S. 9 ordains that a registrable trade-mark must contain or consist of at least one of the following essential particulars:—(1) The name of a company or individual represented in a special manner; (2) The signature of the applicant or his business predecessors; (3) An invented word or words; (4) Word or words not referring to the character or quality of goods and not being a geographical name or

surname; or (5) Any other distinctive mark approved by the Board of Trade. By 'Distinctive' is meant that which is adapted to distinguish the goods of the proprietor from those of other persons. As regards invented word the House of

Lords did in *Re Easterman Photographic Material Co., Ltd.*, otherwise called

the Solio Case much relaxed the tension of the expression and the test suggested was, "Is this a word that may or may not be wanted and reasonably wanted for use in trade, *i. e.*, by traders other than the particular trader applying for registration? If yes, registration should be refused, otherwise it should be allowed, and this is the standard to which the definition in the Act of Parliament should be made to conform".

In the case of Cotton-marks the provisions are somewhat modified and no words, standing alone, are to be registered for cotton

Cotton-marks.

piecegoods and no registration of a cotton-mark is to give any exclusive right to the use of any word, letter, numeral, line, heading, or any combination thereof. Application for registration is to be made to the Manchester Branch Office superintended by the Keeper of Cotton-marks who is to give all necessary information to the Registrar. In England Trade-mark may be limited, in whole or in part, to one or more specified colours. In the case of persons carrying on

Sheffield Marks.

business in metal goods in Hallamshire or within 6 miles thereof application for registration has to be made to the Cutler's Company of Sheffield instead of the Registrar of Trade-marks. Marks called

Certification Marks.

Certification Trade-marks are used for conveying to those who see it the information that the owner thereof has examined the goods and affixed the mark for the purpose of certifying the result of such examination, in respect of the origin, material, mode of manufacture, quality, accuracy or any other characteristic of the goods. Such marks may be registered though no goodwill may be attached to them and the leave of the Board of Trade must be obtained for assignment.

Further the use of the Royal Arms, without the authority of His Majesty, in connection with any trade, business, calling or profession so as to lead others to believe that the person using them is employed by or supplies goods to His Majesty or Member of the Royal Family will be restrained by injunction but a proprietor of a trade-mark containing such arms, device, emblem or title cannot be interfered with.

Royal Arms.

In *Singer Manufacturing Co. v. Wilson*, the question for decision was whether a "Heading" could be the subject of Trade-mark. The evidence showed that the heading used was distinguished from others in Turkey and that it had become a Trade-mark although it was sometimes associated with stamps on the goods of the Lion and the Sun and other devices, and that customers had bought goods because of this particular heading. In holding that the plaintiffs were entitled to restrain other persons from using it Sir Hall V. C. said,

2 Ch. D. 434.

"If a man has acquired legitimately a right to the property in an exclusive use of a name, it is of small account to him, should it be invaded, whether the invasion comes from a purpose to deceive or from ignorance or inadvertence or an honest misconception of the relative rights of the parties; and the law ought not to permit and will not permit the continuation of the invasion, whatever may have been its origin."

Sir Jessel M. R. laid down the principles for future guidance as follows,

"It is quite immaterial that the maker of the goods to which (what I will call for the sake of shortness) the Trade-mark is affixed did not know that it was Trade-mark and had not the slightest intention of defrauding anybody. He must put as a mark on goods, even though he intends to establish it as his own Trade-mark that which is the known Trade-mark of other people and he would be restrained by injunction though he thought he himself had invented the Trade-mark and *bona fide* intended it to designate

goods of his own manufacture, and the reason is obvious, because the goods pass from hand to hand, and though he may act with the utmost *bona fides*, yet the ultimate purchasers might believe that they were the real goods, that is to say, that they were manufactured by the person entitled to the original Trade-mark. Therefore in that case, knowledge that he is doing anything wrong is immaterial even in the maker. Another element which is sometimes imported into these cases has also no material bearing that is, that if the maker knows that they are not the goods of the person entitled to use the Trade-mark and communicates that knowledge to the immediate purchaser, it makes, as I have said, no difference; and even if he does not know it, and tells the immediate purchaser that the goods are of his own manufacture it will still not save him from an injunction, because, although the immediate purchaser from him is aware that the goods in question are not manufactured by any other person than the vendor, yet, as he passes them on, the representation does not necessarily pass on with them, and therefore the next purchaser or the following or some other purchaser or the public at large, who are the ultimate purchasers, would be as much deceived as if no such communication took place. Consequently you have nothing more to do than to show that the Trade-mark has been taken."

Acquisition of Trade-mark :—It is the adoption and use of Trade-mark that gives a title to it. It becomes the property of a firm as soon as it has been so employed in the market as to indicate to purchasers that the goods bearing it is the manufacture of the particular firm. The actual length of user is not an important ingredient provided it has been used long enough to render it probable that a reputation has been acquired ; (per Crowe, J. in *Badische Anilineund Soda Fabrick v. Tjgall Goodoo*).

5 Bom. L. R. 1025 (1903).

A Trade-mark belonging to a firm will be available for any partner of that firm carrying on that business as part of the partnership assets, in the absence of express provision to the contrary. A seller of goods has no exclusive right to a mark.

denoting the goods he sells even though it may have been designed by himself, because a mark representing truthfully the reputation or quality of the goods irrespective of the reputation of the seller can give no right to restrain another person from using a similar mark truthfully indicating quality, as no reputation of the seller is injured and no deception is practised on the public. The mark must represent that the quality is wholly or in part due to and guaranteed by some person connected with the origin or history of the goods as in such a case the public

rely upon the reputation of that person
I. L. R. 30 Bom. 61 (1906). and no other individual can make such representation ; (*see Vadital Sakalchand*

v. Burditt). There is no monopoly or exclusive right to the use of any words, letters, animals or devices such as exist in copyright or patent. If once a person establishes that the particular device indicates his manufacture so that a purchaser seeing it would conclude it is plaintiff's manufacture the Court will protect the plaintiff against not only the particular device but against any imitation calculate to deceive the public (per Tyabji, J. in *Badische Aniline v. Farbenfabriken*).

The question of the right to the exclusive user of a Trade-mark is mainly a question of fact. There must be evidence showing such connection between the mark and the person using it as to indicate to the ordinary purchaser in the market that the goods are of that particular person. For a trade number to acquire a reputation in the market it is not sufficient that persons buy goods by that number and not from an examination of the quality of the cloth. There must be such an association between the number and person's name as to indicate to the public that the goods bearing it come from that particular person. The right of exclusive user of a name or number as a Trade-mark is not an absolute and unqualified right which would entitle the owner to prevent another from using it under all circumstances. To interfere there must be

a reasonable probability and not merely a possibility of deceiving
 the purchasers thereby ; [*Barlow v. Govindaram*].

I. L. R. 24 Cal.
 264 (1897).

In this connection it will be advantageous to quote in
 G. 896. ³ Deg. M. and *extenso* the English case of *Burgess v. Burgess*. A son set up a new shop from his father whom he was assisting. The father's label was "107 (*Royal Arms*), *Strand Corner of the Sevoy Steps, John Burgess and son original and superior Essence of Anchovies*". The son put up a board in front of his shop "W. H. Burgess, late of 107, Strand". His label was "36 *King William Street, City London, (Royal Arms), late of 107, Strand, Burgess' Essence of Anchovies*". Sir Kindersley, V. C. granted an injunction as to "late of 107, Strand", but part of the motion referring to the words "Burgess' Essence of Anchovies" having been refused the plaintiff appealed. In distinctly refusing to deny a man the use of his name Sir L. J. Knight Bruce said,

"All the Queen's subjects have a right to sell their articles in their own names and not the less that they bear the same name as their father's. The defendant carries on business in his own name and sells his essence of anchovies, as "*Burgess' Essence of Anchovies*", which is in truth it is ;

and Sir G. Turner, L. J. added that

"Where a person was selling goods under a particular name, and another person, not having the name, was using it, it might be presumed that he so used it to represent the goods sold by himself as the goods of the person whose name he used ; but that where the defendant sold goods under his own name, and it did happen that the plaintiff had the same name, it did not follow that the defendant was selling his goods as the goods of the plaintiff."

Such possession and use of a Trade-mark in one market as to constitute a right in it establishes in the owner thereof an exclusive right to that Trade-mark in other or foreign markets,

although the owner may not have used it in such markets. When by his conduct the plaintiff led the defendant to believe that he claimed no right to a certain Trade-mark and the defendant did adopt it and by his industry secured a wide popularity for it in the Indian Market, the plaintiff was estopped from denying the defendant's right to use the Trade-mark in the Indian Market ;
 (*Lavergne v. Hooper* .)

I. L. R. 8 Mad. 149 (1885).

In *Nemichand v. Wallace*, Sale, J., held that a counterfeit Trade-mark is one either designed and used with the intention of deceiving or which by reason of its resemblance to another pre-existing mark is calculated to deceive apart from any dishonest intention. The effect of the ruling in *John Smith v. Reddaway & Co.*, I. L. R. 32 Cal. 401, noted under the heading 'Infringement' *infra*, is that if the object was to deceive the Court will presume as against the infringer that the means employed to cause deception was calculated to effect that purpose ; and that it is only when the fraudulent design is negatived it becomes material to enquire whether the resemblance between the two combinations of marks was calculated to deceive.

4 C. L. J. 268.

An importer of goods, though he may happen to be the sole agent for sale, has no right in the Trade-mark of the exporter and cannot maintain an action for its infringement but when once he has obtained a reputation in the market he can restrain others from imitating any mark or design indicative of importation by him ; (per Batty, J. in *Heiniger v. Droz*). In *Ebrahim Currim v. Essa*

I. L. R. 25 Bom. 433,
 (1901) I. L. R. 24 Mad. 163,
 (1901).

Abba Sail, A. sued to restrain B from importing and selling umbrellas bearing a Trade-mark similar to the one in the umbrellas which he claimed the sole right of importing into Madras. B pleaded that A was not the importer and could not lawfully claim the use of the Trade-mark, that the Trade-mark belonged to C in Glasgow, who supplied umbrellas to him, and that the similarity of the Trade-marks was not calculated to deceive. It was held distinguishing the

case in I. L. R. 8 Mad. 149 (*see* p. 7 *ante*) that the prior use in Scotland did not justify the Scotch Firm or B in claiming that A's user of the Trade-mark was illegal or otherwise than an exclusive use.

2. Assignment and Transfer of Trade-mark.

A Trade-mark can be assigned during the proprietor's lifetime and transmitted at his death but the assignment and transmission can only be in connection with the good will of the business concerned in the particular goods or classes of goods for which it is the mark or in respect of which it is registered. An assignee cannot get an exclusive right to a Trade-mark unless the assignment is of the business co-extensive with the Trade-mark. A Trade-mark cannot be severed from, and used independently of, the good-will, and on the sale of the good-will of a business it passes to the purchaser, whether specially mentioned or not. In *Anookool Chunder*

I. L. R. 27 Cal. 779, (1900).

Nundi v. Queen Empress, it was held that the mere fact a bank imported and sold gold bars with a particular mark impressed upon them, which was not originally theirs, but belonged to a Bank that had ceased to exist, without proof of any transfer or assignment of the mark, or of its having survived the old bank in the sense that it was a continuation of that Bank under another name or that it succeeded to the business or acquired the good-will of that Bank was held insufficient to establish that the mark was its Trade-mark.

It is a trite law that an assignment without business confers no effective right. So a manufacturer of watches who supplies solely to another who is actually selling them, though interested in the success of the business of the seller, cannot maintain an action for breach of Trade-mark, as he can never be put in the shoes of the seller in vindicating his rights against the wrong doer; (*per* Lord Robertson in

¹³ C. W. N. 82 (1908),

Ullman & Co. v. Cesar Leuba). It is of the essence of a Trade-mark that its representation should be true as it is a mode of warranting the origin of the goods to which it is attached or their trade association. In *British*

American Tobacco Co., Ltd. v. Mahboob Baksh, the assigner

I. L. R. 38 Cal. 110 of the Trade-mark used indiscriminately
(1911). four different Trade-marks in connection with his cigarettes, consisting of picture representations of the Hindu Gods: Gopal, Jugal, Jagat-dhatrī and Durga. The several marks did not indicate the use of different tobacco with respect to each or any difference in manufacture. The assignment of one of the Trade-marks "Sri Durga" was held not to convey any title to the assignee. (*Per Jenkins, C. J. & Woodroffe, J.*). In *Leather Cloth Co. v. American Leather Cloth Co.*,

11 H. L. C. 523.

it was held that the property in a Trade-mark cannot be assigned independently of the manufactory of the goods. In that case the House of Lords sustained the judgment of Lord Westbury and declined to protect the user by the plaintiffs of a label or advertisement containing false statement as to the character and manufacture of their goods. Lord Westbury said,

"Property in a Trade-mark is the right to the exclusive use of some mark, name or symbol in connection with a particular manufacture or vendible article; consequently the use of the same mark in connection with a different article is not an infringement of such a right of property. I cannot receive it as a rule, either of morality or equity, the plaintiffs are not answerable for a fraud because it may be so gross and palpable that no one is likely to be deceived by it. If there is a wilfully false statement I will not stop to enquire whether it is too gross to mislead."

3. Infringement of Trade-mark and Remedies therefor.

Infringement:—The ground upon which a person is restrained from using another's Trade-mark is that he is gaining an advantage by the use of a particular Trade-mark which is another's property. The plaintiff must establish the existence of his Trade-mark, his exclusive right therein, the fact of imitation and the absence of his license or acquiescence. He must come to Court with reasonable promptitude as he may lose his right by his own delay and acquiescence. Intentional fraud or actual deception need not be proved. If the resemblance is

such as would be likely to cause one mark to be mistaken for the other it is sufficient ; (*Ewing v. Grand Smith & Co.*). A trader has a right to use any mark he pleases so long as he does not infringe any body's Trade-mark or his mark is not calculated to mislead the public into the belief that they are buying the goods of one particular manufacturer, when they are not his goods. In order to find out whether a certain mark is calculated to deceive, the Court may itself examine the two marks to form its own opinion and may also consider if the marks are calculated to deceive up-country purchasers, who are ignorant and unwary, if the goods are despatched and sold up-country in India ; (*Nemichand v. Wallace*).

2 Hyde 185, (1864.)

I. L. R. 34 Cal. 495, (1907).

The foundation of the suit for injunction against the defendant for palming off his own goods on the unwary public is misrepresentation to, or deception of, the public. A trader is not entitled to pass off his goods as those of another by selling them under a name which is likely to deceive immediate or ultimate purchasers although in its primary meaning the name is only the true description of the goods. So where *Reddaway & Co.*, the plaintiffs, sued for an injunction to restrain defendants from using the words, "Camel hair" as regards the Belting sold by them and not manufactured by the plaintiffs, without clearly distinguishing their article, and the plaintiffs proved that the name "Camel Hair Belting" had come to mean in the Indian market plaintiffs' Belting and nothing else and that the defendants were selling Belting made of 'Camel hair' designating it as 'Camel Hair Belting' so as to be likely to mislead purchasers into the belief that it was plaintiffs' Belting and endeavouring to pass off

I. L. R. 32 Cal. 401, (1905).

their goods as plaintiffs' goods, held by *Maclean, C. F., Sale & Harrington, J.J.* that the plaintiffs were entitled to an injunction ; (*John Smidl v. Reddaway & Co.*).

There is a distinction between a passing off action and a common law action for deceit. The general principle applicable

to the former is that nobody has the right to represent his goods as those of somebody else. In *Manna Lal Serowjee v. Jawalla*

I. L. R. 35 Cal. 311, (1908).

Prasad, which was an action for injunction on the ground of deception Fletcher, J. held that it was unnecessary to prove fraudulent intention and evidence relating thereto was therefore inadmissible, as a man must be taken to intend the reasonable and natural consequences of his own act. Against this decision the defendants appealed, but the appeal was dismissed. It may be stated that in this case the plaintiffs' ghee was being sold in Calcutta and foreign markets in canisters bearing an embossed mark consisting of 'a flower on a stem with leaves of the shape of an eclipse, with an indented circumference having, within it the initials of the plaintiffs' firm'. The defendants used on their canisters of ghee a colourable imitation of the plaintiffs' mark for sale and export in the same market. Both the Courts came to the conclusion that the defendant did deliberately imitate the plaintiffs' Trade-mark for his own purposes, and that unless the name which was in Devanagari characters in defendant's tin was read, it was not distinguishable and granted injunction and enquiry as to damages:—Woodroffe, J. in pointing out the difference between the standards of judgment adopted in England and India in infringement cases said,

"The case cited, *Blackwell v. Crabb*, must be taken in relation

36 L. J. Ch. 504.

to the circumstances of that case and the country in which that judgment was pronounced. There it was an English name; and the mark was current in England, and naturally the name could be read and understood by every body. But here the name is in Devanagari character, which is not readable by the great portion of the public." (*Jawalla Prasad v. Manna Lal Serowjee*).

I. L. R. 37 Cal. 204, (1909).

A Trader importing goods cannot lawfully adopt a Trade-mark likely to cause his goods to bear in the market the same name as that of a rival trader; (*Taylor v. Virasami*). Where a Trade-mark

I. L. R. 6 Mad. 108.

has been innocently and even unconsciously made use of to the injury of another the owner of the Trade-mark is entitled to the protection of the Court ; as the same evil effects would be produced whether it is affixed for fraudulent purposes or not.

(*Per Cottenham L. C. in Millington v. Fox*). The explanation given by Wood, V. C. in that case is

“that although a person had used another man’s Trade-mark perfectly innocently, yet if he continued for one moment after he had been told of it to use another man’s Trade-mark, he did so fraudulently, and if he sought to keep in pocket profits which he had made by representing, however innocently, that his goods were another person’s, after he had been told of the fact, it was fraud.”

Remedies:—A person whose Trade-mark has been infringed has two remedies : *viz.*, civil and criminal. The civil remedies are injunction under the Specific Relief Act, I of 1877, S. 54, Damages and Account of Profits, with incidental discovery and inspection. Before considering them in detail it is convenient to consider first the cases where punishment has been meted out to persons charged with contravening sections 478 to 489 of the Penal Code.

Criminal Remedy :—In *Radhakrishna v. Kissonlal*, it was held that the name of a Calendar “Sri Chandu Panchang” published by the descendants of Chandu and used by the defendant so as to make people think that the defendant issued the Calendar (which cannot be said to be manufactured), is not a Trade-mark under S. 478, I. P. C. nor, as being unauthorized, a false trade description under S. 4 of the Merchandise Marks Act. The case of *Emperor v. Backaullah Mallick*, decided by Ghose & Stephen, JJ. lays down what is required to prove liability for infringement under criminal law. The complainants there were selling fish hooks from December 1900, in boxes

I. L. R. 26 Bom.
389, (1912).

I. L. R. 31 Cal.
41, (1904).

bearing labels, with a design of *'two fish crossed, with their heads and tails bent up'*: and their fish hooks were generally known in Calcutta as "*Mach (or fish) marka* " and was commanding a large sale. In 1903 the accused sold fish hooks in boxes the labels whereon bore *'one fish mark with its head and tail turned up'*. The shape and appearance of the boxes and labels of the accused were different from that of the complainant and the name of the maker was truly given. The complainants charged that accused's boxes were a fraudulent imitation of theirs, devised to sell their fish hooks as '*mach marka*'. The Court held that the accused had not committed an offence under section 482 I. P. C. or S. 4 (1) of the Merchandise Marks Act, the complainant's '*Mach marka*' not being descriptive of fish hooks, and the mere fact that complainant's fish hooks were already known as '*Mach marka*' not giving them an exclusive right to prevent others from applying a mark to fish hooks, which might be generally known by the same term but was otherwise sufficiently distinguishable from their mark, because the essential feature of the design was too common and too apt for application to fish hook for a name based on it to be reasonably calculated to deceive.

In *Reddaway v. Banham*, it was held that a name which in its primary sense is a correct description of the goods to which it is applied may acquire in the trade a technical signification identifying it with the goods of a particular manufacturer and not of a particular make, so as to be entitled to protection; and thus the secondary sense acquired may make the primary sense a falsehood. A company had been importing white shirtings from Holland bearing the mark "*H. B. T. C. 40,000*" *a label with a lion and a snake design and an oval stamp containing in it "Sole importers to the Holland, Bombay, Trading Company, Ltd."*, and a buff heading, and the accused had in his possession for sale some packages of white shirtings bearing the mark "*H. P. F. C. 40,000*," *and a label with two lions and two snakes and an oval stamp containing in it "Sole import-*

(1896) A. C. 196,
(H. L.)

ers Holland Export Co." and a buff heading, which were printed in types similar to those of the former and in the same size and colour. The complainant proved that the accused's marks were not the manufacturer's but the importer's. The accused was found guilty of using a false Trade-mark and was punished under ss. 482 & 486, I. P. C. and it was held that the *onus* was not on the complainant to show that the accused acted dishonestly but on the accused to show that his case fell within the exception to the latter section; (*Holland Bombay Trading Company v. Buktiar Mull and Bal Kissen*).

8 C. W. N. 421.

Although a trader imitating the get-up of the packages of another seller of goods may be restrained by injunction in a civil action from so doing, the get-up does not constitute a Trade-mark under the Penal Code, which deals only with Trade-marks proper and is not applicable to cases analogous to Trade-marks; (2 L. B. R. 159). In *Manavala Chetty v. Emperor White*,

[1] L. R. 29 Mad. 569 (1906).

C. J. held that to constitute an offence under S. 418 I. P. C., it is unnecessary that the complainant should have acquired a Trade-mark in the sense used under the English Act of 1883, and a person who sells soap not manufactured by Pears in a box whereon the name of Pears appears as the maker of the soap uses a false Trade-mark, even though it appears not upon the goods themselves, but upon the box containing it, and is punishable under S. 482 I. P. C. But a dealer in piece-goods does not commit any offence under S. 482, or 486 I. P. C. by selling, without removing the labels, goods purchased by him in the market, bearing complainant's Trade-mark labels; (*Mati Lal Premasuk v. Kanhai Lal Dass*).

I. L. R. 32 Cal. 909, (1905).

A counterfeit Trade-mark is one which by means of its resemblance to a genuine one is intended to deceive and lead a purchaser to imagine that the counterfeit is in reality the genuine article. In a prosecution for counterfeiting a Trade-mark, if the Magistrate is satisfied that there is dispute between

the parties as to the right of user of a Trade-mark, he should not deal with the matter criminally but should leave the complainant to establish his Trade-mark in a Civil Court; and prosecute the accused under S. 486 I.P.C. if he is then found fraudulently counterfeiting that Trade-mark; (*Doolat Ram v. King Emperor*).

I. L. R. 32 Cal.
481, (1905).

Where in 1893 the complainant called upon the persons selling goods alleged to bear counterfeit Trade-mark to discontinue the use of that mark and to render him an account of sales, with a reservation of his rights to proceed further, and in 1898 prosecuted them for using the counterfeit Trade-mark, *held* that the criminal prosecution was time-barred under S. 15 of the Indian Merchandise Marks Act, 1889, as there was no proof that he believed the discontinuance of the user of the counterfeit Trade-mark, after his first discovery in 1893, and he must enforce his remedy by civil process; (*Ruppell v. Ponnusawmy Thevan*).

I. L. R. 22 Mad.
488, (1899).

Books are the subject of Trade-mark and are covered by the word 'goods' in S. 2 (4) of the Merchandise Marks Act; and a person selling a book with a counterfeit property-mark commits an offence punishable under section 486 I. P. C. (*Kaniah Das Bairagi v. Radha Shajana Basack*). When the title page of the

I. L. R. 26 Cal.
32, (1899).

alleged piracy and the title page of the complainant's book are so different that no one is likely to be misled, a conviction can not be had under the Penal Code, though the use therein by the accused of the word 'Copyright', which is proved to be a false trade description, makes him guilty under ss. 6 and 7 of the Merchandise Marks Act; (7 *M.L.T.* 309). Where rose water was sold by the complainant in bottles, with labels, and the accused, a neighbouring shop-keeper, sold rose water in similar bottles with similar labels but the labels on closer examination showed differences *held* that the accused was not guilty under ss. 482 and 486 I. P. C. (11 *C. W. N.* 887).

Civil Remedies :—The remedies for infringement given by Civil Courts are injunction, damages and costs. The proceed-

ings in equity in England are discovery and inspection, injunction, destruction of spurious labels, and destruction of goods where it is impossible to remove the labels or imitation. In the case of infringement, through *bona fide* ignorance, a slight alteration in Trade-mark is granted and the defendant is allowed to sell his goods.

The following defences may be urged successfully in actions for infringement :—1. Non-infringement, 2. Plaintiff's Trade-mark bad in itself, 3. Trade-mark severed from good will, 4. License from plaintiff or co-proprietor, and 5. Delay and Acquiescence. Of the inoperative defences the following may be mentioned :—(1) Ignorance, (2) No intention to sell, (3) No actual deception or fraud, (4) Immediate purchasers not deceived, (5) Indication of quality as well as manufacture, (6) Words ambiguous, (7) Only part of mark taken, (8) Defendant's own name (as it is no protection if used so as to deceive), and (9) Name inaccurate in secondary meaning only.

The use of a man's own name is not restricted unless fraudulent intent is clearly proved. Mere confusion is no ground for relief. When a person has allowed another to use his name and acquire a reputation under it he will not afterwards be allowed to himself use his name so as to deceive nor to empower others to use it to produce that result, nor such others permitted so to use it, *e. g.* in the case of an employer leaving his master. (See *Birmingham Vinegar Brewery Co. v. Liverpool Vinegar Co.*)

4 T. L. R. 613.

There may be a right to the exclusive use of a Trade-mark by a trader who is an importer only; (*Ralli v. Fleming*). In that case the plaintiffs imported and sold, from 1872, grey shirtings described as 7½ lbs. marked with a stamp in blue colour of a turtle in a star with the words 'trade-mark'; underneath in a semi-circular form the name 'Fleming Galbraith & Co. Manchester' and underneath that No. 39 within a star, and at the bottom of each

I. L. R. 3 Cal. 117.

piece the No. 2008. The defendant was found in 1877 to sell cloth of similar quality with a *stamp in blue colour of a rose in a square underneath in a semi-circular form the name "Ralli and Mavrajani"* and underneath that No. 39 *within a star*, and at the bottom the No. 2008. The Court found defendant's mark to be a colourable imitation of the plaintiff's mark, calculated to mislead the public into the belief that they were purchased goods imported by the plaintiffs and granted injunction.

In the West End Watch Co. v. The Berna Watch Co., Scott C. j. decided that there can be no property in a Trade-mark in gross apart from the goods of which it has become a symbol. The importer who, by advertising and pushing the sale of goods under a particular Trade-mark secures a wide popularity in relation to the goods he sells, is entitled to the protection of the Court for that mark in the country of importation even against the purchaser of the goods and the fact that the mark was always used in conjunction with the seller's name is not conclusive to show that the mark cannot be claimed as a Trade-mark. Here the plaintiffs, the West End Watch Co; were the sole importers and agents of the watches of a factory in St. Imier in Switzerland and on the dial was printed a device with the words *Berna and West End Watch Co.* The watches gained popularity in the Indian Market as the Berna Watches. The plaintiffs discontinued sending orders to the defendants who succeeded the St. Imier Factory and imported watches from other factories, which they sold under the name and style of "*Secular or the Railway Service*" after advertising and informing their constituents that they were doing so owing to the deterioration in the making of the Berna Watches. The defendants who had incorporated themselves as "*The Berna Watch Co.*", opened an office in Bombay and issued a circular referring to the plaintiffs as their agents who had sold 600 Berna Watches, but stating that the watches would no longer be sold by the plaintiffs as their *sole* agents as the defendants had decided to deal themselves directly. On the plaintiffs suing for restraining the

13 Bom L. R. 212
(1911).

defendants from using or imitating the various trade symbols alleged to be of plaintiffs and representing their business as the plaintiffs' held that as the plaintiffs had evinced an intention to abandon the name "Berna" as the quality mark of their watches they could not claim an exclusive title to the use of that name, either alone or in a Trade-mark with a symbol, but that they were entitled to an injunction restraining the defendants from representing that they were carrying on the business whereof the plaintiffs were the sole agents or were successors in plaintiffs' business.

The Madras case of *Nooroodeen Sahib v. Charles Souden*,

15 M. L. J. 48
(1906).

in the decision of which Davies, Benson, Moore, Boddam and Bashyam Aiyangar, JJ. took part, carries still further the principle on which injunction may be granted. In this case there were two sets of plaintiffs, the Importers in Madras and the Shippers in Manchester, who claimed an exclusive right to the device which constituted the facing imprinted on their *grey shirting* and consisted of the following combinations of words, designs, letters and numbers:—(1) *T.A. Taylor & Co.*, (in Roman Capitals), (2) *A Coat-of-Arms*, (3) *T.A.T.* (in script form), (4) *Scimitars* placed *horizontally*, (5) *Figures showing weight*, (6) *A number*, (7) *A circle within a circle* with inscriptions denoting the firm, (8) figures showing *length in yards*. (9) *A letter* (Roman Capital), and (10) *A number*: The Scimitars and Coat-of-arms were registered in England in 1882 and 1883 by the Shippers as Trade-marks on cotton piece-goods under the English Act. The above facing was used by the plaintiffs, continuously and uniformly, from 1889 and there was no similar facing in Madras. The goods gained a large reputation in the market as 'tulwar', 'Taylor House' or 'Kutti' shirtings. The defendants who carried on business in cotton goods solely, ever since 1896, used in 1898 scent bottles for the shirtings imported and sold by them and were altering the face since and at the time plaintiffs brought the suit complaining of infringement of their device the defendants' facing on their

shirting contained the following : (1) *T. Noorooddeen Sahib & Co.* (in Roman Capitals), (2) *A coat-of-arms*, (3) *Words in Tamil and Telugu signifying scent bottles*, (4) *Cut-glass scent bottles placed horizontally*, (5) *Figures showing weight in lbs.*, (6) *number*, (7) *A circle within a circle with inscriptions denoting the firm*, (8) *Figures showing length in yards*, (9) *A number*, and (10) *A letter, (Roman Capital)*. The plaintiffs claimed an injunction restraining the defendants from using their facing which they had recourse to palm off their goods as those of plaintiffs'. In granting the injunction (Davies, J. dissenting) the Court held that opinion evidence that under-purchasers would be deceived was inadmissible, and that to get an injunction it is not necessary to prove that any one has in fact been deceived and it is sufficient if defendant's Trade-mark bears such a resemblance to that of the plaintiffs' as to be calculated to mislead incautious purchasers, and Moore, J. said,

" No man may canvass for custom by falsely holding out his goods or business, whether by misleading description, or by colourable imitation of known marks, packages and so forth as being the goods, or business of another, though style or words appropriated by the defendants are in themselves not false as he uses them or the plaintiff will have a virtual monopoly in an exclusivedesignation which is not capable of registration as a Trade-mark."

In a more recent case in Madras *Mahomed Esuf v. Rajaratnam Pillai*, where the plaintiff stated that the name ' Albert ' by which his cigars acquired a reputation for 17 years in the market was utilised by the defendant to pass off his cigars as plaintiff's and sought for an injunction, *White, C. J. and Krishnasami Aiyar J.* laid down that it is settled law that a trader or a manufacturer of a particular article who adopts therefor a fancy or descriptive name cannot restrain another from using it, simply because the article so named has acquired a reputation, even though the public have grown accustomed to buy the article only relying on the name and without examining the quality, but he must further show that the public have grown

I. L. R. 33 Mad.
402, (1910).

to associate that particular name with himself as the manufacturer or dealer.

In *Khan Elahi v. Abdul Aziz*, the plaintiff alleged that he had acquired by registration and by use the ownership in the Trade-mark "*Scissors*" with the device of an *ordinary pair of scissors* used upon packets of thread sold by him in open market and that the defendant infringed his mark by using on his packets of thread a device including a pair of trummers which to the ordinary eye of a man uneducated in pictures and possessed of no abnormal powers of observation was a pair of scissors and prayed for injunction and damages. Injunction was granted but no actual damage having been proved a decree for compensation was refused. The case of *Abdul v. Mahomed Ally*, which was decided by *Jenkins, C. J., Russel and Whitworth JJ.* may be quoted as an illustration of the equitable maxim that he who seeks the equitable remedy of injunction must come into Court with clean hands. So a person who has for his Trade-mark a colourable imitation of other registered labels to deliberately mislead customers and sell his wares as those of others, cannot restrain others from imitating his label.

To conclude, the Indian Legislature would do well to codify the Law relating to Trade-marks in British India, in the light of the above decisions, and place the law on a more definite footing. The provision for a Public Registry, as in the case of Patents and Designs, would give more publicity to the Trade-mark and would afford better protection to manufacturers and traders by keeping their rivals under an efficient control.

¹⁰ P. L. R. 493,
(1909).

³ Bom. L. R. 220,
(1907).

COTTON MANUFACTURES IN BERAR.

BY

H. R. Pitke, Esq.,

Prices Current Inspector, Berar, Akola.

India, at a time when other nations of the world were in their infancy, boasted of a civilization and commercial activity which may even now be said to be the glory of a great past. India grew her own cotton, spun it, wove the cloths for her consumption and then exported to foreign countries large quantities of the best fabrics, which fetched in those countries high prices owing to their excellence and superb finish. During the days of her glory, there was no lack of intelligence, industry or of enterprising spirit. Commercial prosperity, though well assured by India's insular position and the frugal habits of her children, was bound to succumb to the necessary deteriorating influences which a sense of ease and comfort naturally create. While our forefathers produced inventions which are admired even to this day and made discoveries which have contributed to the happiness of mankind, their children in succeeding generations did not care to maintain her position by equal, if not superior, skill and strenuous efforts on their part. Luxury took the place of industry, idleness that of enterprise and intelligence. These are the main causes of the decadence of India's dying arts and industries.

Besides this, the introduction of power looms into the various parts of Europe and of America made a great revolution in the trade. The Indian markets were flooded with cheap machine made goods from the West. The proper success of cotton manufacture depends mainly on the skill of the labourers. The material and moral condition of our mill hands leaves

much to be improved. Utter lack of education makes them mere machines. They have got no originality. This state of things tells on the working of the mill industry, while the European countries, with a short working day, can manage to surpass the Indian mills owing to a better class of labour. All the defects, *i.e.*, the absence of good and healthy residential quarters, must be removed and provision made for education and other conveniences by which their life may be comfortable, to ensure the satisfactory working of the mills in India.

With the present awakening, a new spirit is visible and commercial stimulus is likely to follow.

New Era.

In this state of affairs, an enquiry into cotton manufactures may not be out of place. It is, therefore, proposed to examine the subject more fully.

In my last note on cotton, an attempt was made to show the growth of cotton and the ways of improving the same. Cotton fibre must, therefore, necessarily form an important asset of a nation's wealth. In days gone by, Northern India was the centre of the manufacture of a variety of cotton fabrics. To-day Western India carries the palm, so far as improved methods of weaving are concerned. Central Provinces and Berar which may be said to form a part of Western India contribute a considerable share in the production and manufacture of cotton. In the Districts of Central Provinces and Berar the following varieties of cotton are generally in use for spinning purposes :—

(1) Ohanda Jadi, (2) Bani, (3) Nagpur Jadi or Kata, Katil, Vilayati, Havar, &c. are known. Berar Jadi has nearly disappeared. Bani has deteriorated in places and is capable of spinning up to 40's and is as good as it was 40 to 50 years ago. Jadi had its own market and forms a profitable export to the European countries for mixing with wool.

Under the system of selection practised by the ryot or cultivators the short staple cotton seed is much sown. This

explains the important changes that have taken place in the cotton supply during recent years. There is a complaint regarding the deterioration of staple when some ten years ago Jadi cotton was considered suitable for 16's to 20's counts but it is not fit even for 10's. Bani is equal to middling American cotton, will spin 32's easily and 40's with difficulty. Jadi is popular for its larger yield. It ripens early and can be brought to market for sale by the end of October. It requires less rain than any other variety if it be well distributed. 30 inches or a little less than 30 inches rainfall is sufficient for the crop in Berar. The following is the table of rainfall :—

Amraoti.

Akola.

Buldana.

Yeotmal.

It attained great popularity in Berar, and the cultivators found it profitable, because demand for it was great. When the demand is less for the short staple, the long staple cotton naturally takes place of the former. This change depends on the market requirements. The capitalists and traders must, therefore, pay attention to this important factor as was done, for the Indian cotton at the time of American War, by the Court of Directors in England. Encouragement was given to the Indian cotton and the largest movement of the British Cotton Growing Association of 1902 in England through Lord George Hamilton, the Secretary of State for India has caused the Government to take action in the improvements of cotton staple.

There are several varieties, *i. e.*, nearly 92 in number yet no complete census of these has been made. There are two principal varieties at present :—

(a) Varieties, which ripen in about 5 months (early crop, Kharif crop or rain crop) consist of the Katel, Havari, Vilayati, etc.

(b) Varieties, which come to majority after 8 months (Rabi, winter or late rain crop) consist of Bani, Jadi, etc. There are 18 varieties out of 92.

The increasing number of mills in India, Japan, China etc., appear to favour this short staple but Japan is trying to have her own cotton. Great Britain does not get the supply she wants for her mills but may hope to get it in future as the Government has paid attention to this subject.

In Berar cultivation of cotton (short staple) has increased rapidly, as will be seen from the following. The area for C. P. and Berars and in the Bombay Presidency is :—

	1909-10.	1908-09.	1907-08.
C. P. and Berar	... 3,671,000	4,239,000	4,015,000
Bombay Presidency	... 1,480,000	1,240,000	1,275,000

There has been a large decline in population engaged in indigenous cotton industry. The number in Berar according to the Census is as follows :—

	1881.	1891.	1901.
General population	... 2,672,673	2,897,040	2,754,016
Agricultural population	... 1,171,809	1,986,265	2,016,067

The total workers in the hand-loom industry are :—9,263.

The following castes are engaged in weaving :—Salis, Koshtis, Koris, Mominas, Mabars, Dhangers etc. etc. Hand-loom weaving was the chief rural industry but it has been pushed out by the power Looms. The agricultural class has increased as the weavers, artisans etc., have become agricultural and factory labourers in towns and in cities.

The following statement shows the distribution of workers in weaving industry :—

Name of District.		Year.	Weaving Industry.			
			Cotton.			
			Ginners and pressers (hand and Mill).	Cotton spinners (hand and Mill.)	Cotton printers and dyers.	Cotton weavers.
Amraoti	...	1891	...	...	...	...
		1901	10,045	3,597	859	3,845
Akola	...	1891	...	...	...	...
		1901	12,018	462	589	3,384
Ellichpur	}	1891	...	...	...	...
		1901	3,670	229	1,005	5,132
Buldana	}	1891	...	...	...	...
		1901	2,382	780	1,385	2,755
Mien	}	1891	...	...	...	...
		1901	1,699	532	769	3,552
Balsein	}	1891	...	...	...	...
		1901	728	864	519	1,223
Total	...	1891	...	...	...	...
		1901	30,777	6,464	5,126	20,891

The manufactures in Berar chiefly consist of twist and yarn, coarse cloth and various kinds of native garments. The important centres of hand-loom, with names of articles turned out are given below :—

Place.	Names of Articles.
Akot ...	Carpets, Khadi &c.
Ellichpur ...	Carpets, Khadi, Gulali, male and female garments &c., &c.
Balapur ...	Carpets, Turbans, Rumals, Silk cloth, Khadi &c., &c.

Nandura

Jalgaon ... Tadhaon, Khadi &c.

Daryapur

Babbali ... Khadi, Silk cloth, &c., &c.

Anjangaon ... Male and female garments, Khadi, Silk cloth, turbans &c., &c.

Basein ... Female garments, Khadi, &c., &c.

Umerkhed ... Khadi, &c., &c.

Mien ... Dhoti, Jajam (carpets), female and male garments, Khadi, Laced female garments &c., &c.

Chikhli Sindkhed. Woollen blankets, Khadi &c., &c.

Deolgaon Raja. Silk cloth, Khadi, female garments &c., &c.

Kholapur ... Silk cloth, Khadi, male and female garments &c., &c.

Improved looms have in a few places been brought from outside but they are reported to be working unsatisfactorily. The weavers should be encouraged that they may be able to compete with mill-made goods. Government may be approached with a proposal for establishing model factories in certain places for the purpose of demonstrating the advantages of improved looms and promoting co-operative organisation among the weaving classes. What is now needed is a band of earnest, enthusiastic workers. They should go round and organise Co-operative Societies among the weaving communities and relieve them from their debt.

There are three mills working—two at Akola and one at Badnera in the Amroati District. The cotton industry may be said to be consisting of two groups—(1) The old, and (2) the new. The former gives employment to the village artisans, while the latter has annihilated hand loom weaving in the village and concentrated the weavers in the towns and cities as

labourers in the factories. The new Industry works by steam, which requires an enormous output, and the consequence is that the rural or cottage industry has suffered greatly.

India exports raw cotton in large quantities to China, Japan &c. but as Japan is trying hard for cotton in Korea this export is bound to fall.

The following are the gins and presses working in

Number of gins and presses. Berar :—

Year.	Number of gins.	Number of presses.
1891-92	41	27
1892-93	48	27
1893-94	54	28
1894-95	63	36
1895-96	60	31
1896-97	66	33
1897-98	76	32
1898-99	80	31
1899-1900	88	31
1900	Famine year	
1901	104	42
1902	121	50
1903 to 1905	Not available.	
1906	219	
1907	219	
1908	256	

From this it will be seen that hand-ginning has greatly disappeared. It is going on in a few places for collecting seed. Raw cotton is ginned and pressed into bales for export from Berar :—

Export.

Year.	Bales (Exported).
1895-96	1,954,056
1896-97	1,827,708
1897-98	1,686,115
1898-99	3,208,228
1899-1900	915,157 Famine year.
1901-02	2,206,512
1902-03	3,860,961
1903-04	3,246,201
1904-05	not available
1905-06	do
1906-07	3,941,263
1907-08	3,119,590
1908-09	2,502,191
1909-10	2,042,507
1910-11	2,932,124

The effects of the last famine of 1899-1900 were serious in Berar and in the rest of India too. The practical genius of the people was roused into activity and the cultivators in Berar, Bombay Presidency, Central Provinces, Bengal &c. found out the methods of improvement of the cultivation and manufacture of cotton. The rapid extension of cotton cultivation in a short period is the direct result of the evolution from the Agricultural to the Industrial stage which has taken place in Berar and elsewhere in India. The steady transition from the Agricultural to the manufacturing stage is to a certain degree is now assured.

The orders of the Secretary of State to increase cotton cultivation when the dealers in Manchester and Lancashire urged for the supply of cotton from India have always contributed to this change whereby an enterprising spirit was infused among the Indians. The combined result of this is the starting of great industries on the improved methods and better prices are now offered by outsiders for our mill-made goods. These two have caused the extension of the mill industry.

Railway Communications and Navigation Companies bring about enormous cotton exports within four
 Aid to trade, or five months from January to May.

Formerly there were no presses to press bales and cotton was exported in packages called "Boja" in Berar and "Dokras" in Bombay. No proper arrangements were then in existence to export it as early as possible. Thereby much damage was caused. The journey by road for cotton took twelve days to reach Bombay. So that cotton Department had done much to improve this, as it was created solely for this purpose. Cotton yard system was devised in Berar. Proper arrangements for protection and prevention of accidents were made by Government and when the gins and presses came to be introduced into Berar about the year 1884, the Government withdrew their arrangements.

Road, Telegraph, Telephone, Postal Communications have greatly helped the cotton trade. Establishment of cotton markets within the easy reach of cultivators in various important centres has encouraged this working.

The Law and Rules for the uniform cotton weights in Berar have also played an important effect past in this system.

Credit Societies will be soon established throughout Berar and Urban Societies lately established in Akola and Amraoti, will help the cultivators much in this matter.

The remedy for the removal of the depression and for the progress of the cotton manufacturing industry, is the development of the home-market.

The use of the Steam Power is attended with the following drawbacks :—

- (1) Defective ginning.
- (2) Defective construction of the machinery and its accessories.
- (3) Imperfect setting of machines.
- (4) Irregularity in work.
- (5) Improper care for cotton.

- (6) Non-uniformity of rates of gins and presses to dealers.
- (7) Employment of inexperienced hands.

These causes damage cotton very considerably as it contains certain proportion of comparatively weak fibres.

With the growth of this industry on improved principles, machinery now in use is also improving with the effect that defects in certain places are fast diminishing. The manager's attention is required to the following :—

- (1) Cutting of fibres in the process of ginning.
- (2) Discolouration or staining of fibre.
- (3) Mixing of leaves, broken seeds or other dirt with cotton.
- (4) Moisture in cotton.

These defects should also be removed. Both the traders and managers must be careful in this work.

Small banks, as the Bombay Banks at Akola, Amraoti which assist cotton dealers in these places in the season, are also required in places where there are cotton markets established by the Government.

Co-operation for this purpose is required as explained above among the dealers, capitalists, weavers and cultivators.

These forces will naturally help the cotton trade and manufacture. The Bombay market is

Prices,

governed to a great extent by conditions prevailing in the European and American markets and the Berar markets are ruled by the Bombay market in their turn and thereby prices fluctuate considerably. In 1860 to 1865 high prices were ruling for the Indian cotton, when the American war continued for about five years. For last two years prices ruled high after the closing of the season, *i. e.*, after April 1909 and they continued till 1911. The following are the prices, ruling in the Akola market which is one of the representative markets of Berar.

The variations in cotton prices will be seen from the following statement. Average prices of cotton in the Bombay market on which Berar markets depend greatly, are shown and the cotton prices in the Akola and in the Amraoti markets are also given together with prices of yarn and cloths as tabulated in the Akola market.

Variations in prices of Cotton.

(From Prices and Wages in India.)

Prices of 1893 being taken as 100.

Average Prices.

Year.	Cotton.		Dhollera fair in Bombay. (Per Candy.)		
	Dhollera fair.	Upland middling.			
			Rs.	A.	P.
1873	100	100	199	10	0
1885	98	60	194	14	0
1886	80	57	177	0	0
1887	96	61	191	15	0
1888	99	62	198	4	0
1889	104	66	207	12	0
1890	95	67	190	4	0
1891	84	52	167	8	0
1892	86	46	171	10	0
1893	100	51	199	7	0
1894	89	43	178	8	0
1895	91	42	182	3	0
1896	90	48	180	7	0
1897	86	43	171	3	0
1898	71	31	141	8	0
1899	76	36	151	7	0
1900	108	61	214	13	0
1901	93	53	179	14	0
1902	90	53	170	0	0
1903	101	67	208	8	0
1904	126	73	251	4	0
1905	96	57	192	4	0
1906	110	66	218	10	0
1907	102	72	204	4	0
1908	104	64	207	7	0
1909	122	70	242	2	0
1910					

Average annual wholesale prices of cotton.

(as stated in rupees and decimals of a rupee per ten maunds.)

Year.	Akola.	Amraoti.
	Rs.	Rs.
1897	...	145·99
1898	...	131·48
1899	...	124·23
1900	188·7	187·61
1901	146·98	148·68
1902	161·61	159·26
1903	170·37	170·56
1904	222·7	222·3
1905	168·38	172·5
1906	186·18	189·32
1907	188·44	177·62
1908	177·53	189·0
1909	188·92	210·47

Prices of yarn in the Akola Market.

(Rate of per box containing 10lb. yarn.)

Count Number.	1904	1905	1906	1907	1908	1909	1910	1911
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
6	3 10 0	3 9 0	3 11 0	3 8 0	3 9 0	3 11 0	4 3 0	4 11 0
10	3 13 0	3 12 0	3 14 0	3 14 0	3 11 0	3 13 0	4 5 0	4 15 0
12	3 14 0	3 14 0	4 2 6	3 13 0	3 13 0	3 15 0	4 7 0	5 1 0
14	4 0 0	4 1 0	4 3 0	4 0 0	3 15 0	4 1 0	4 10 0	5 3 0
16	4 4 0	4 6 6	4 4 8	4 2 9	4 3 0	4 5 0	4 14 0	5 9 0
18	4 9 0	4 11 0	4 11 0	4 7 9	4 6 0	4 8 0	5 0 0	5 12 0
20	4 12 0	4 10 0	4 12 0	4 8 9	4 9 0	4 11 0	5 3 0	5 15 0
22	4 13 0	4 14 0	5 1 0	4 11 9	4 9 0	4 13 0	5 6 0	5 14 0
24	5 1 0	4 15 3	5 3 0	4 14 0	4 15 0	5 1 0	5 8 0	6 8 0
26	5 5 0	5 4 0	5 6 0	5 1 9	5 3 0	5 5 0	5 13 0	6 14 0
30	5 9 0	5 14 3	5 10 0	5 9 0	5 11 0	5 13 0	6 6 0	7 0 0
40	... ..	... ..	... ..	6 0 0	6 4 0	6 9 0	7 0 0	8 0 0

The price of cloths sold in the Akola Market.

Year.	Hark 42 yards.	Sahan 38 yards.		Sahan 38 yards.	Jagannath Kori 22 yards.		Jagannath Kori 22 yards.	Jean 40.		Dhotar Joda 11 yards.	Chadar 6 yards.	
		Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.
1891	7 2 0	6 13 0	...	...	...	...	...	...	...	...	...	...
1892	7 6 0	...	...	...	...	...	...	...	...	...	1 9 6	...
1893	8 3 0	...	6 8 3	3 0 0	...	...	...	...	...	...	...	...
1894	8 11 6	8 11 0	7 2 0	3 9 6	...	...	...	...	...	2 7 0	1 10 3	...
1895	8 7 0	8 9 0	7 6 0	...	...	...	...	...	...	2 8 0	1 10 3	...
1896	...	...	...	3 3 0	2 9 0	2 10 3	8 14 0	0	...	2 8 0	1 10 0	...
1897	...	...	6 13 0	3 1 0	2 13 0	2 13 0	8 5 0	0	...	...	1 9 6	...
1898	7 5 6	8 1 0	6 0 0	...	2 8 6	2 8 6	7 4 0	0	...	...	1 10 9	...
1899	7 3 6	...	5 11 6	2 14 6	3 1 0	3 1 0	7 0 0	0	...	2 5 6	...	...
1900	7 11 6	7 9 0	6 11 6	3 2 0	3 1 0	3 1 0	7 13 0	0	...	2 8 0	1 8 6	...
1901	8 2 6	...	...	3 6 0	3 1 6	3 1 6	8 0 0	0	...	2 8 0	...	...
1902	8 0 0	8 7 0	6 13 0	3 2 0	2 9 0	2 9 0	7 13 3	0	...	...	1 6 6	...
1903	8 11 6	8 7 0	...	...	...	...	7 13 3	0	...	...	1 10 0	...
1904	8 10 0	...	...	...	3 2 0	3 2 0	9 12 0	0	...	...	1 13 0	...
1905	9 1 6	9 12 0	...	3 12 0	3 6 0	3 6 0	...	0	...	2 12 0	1 13 9	...
1906	9 6 6	9 12 0	...	...	3 11 9	3 11 9	10 9 0	0	...	2 12 0	1 15 3	...
1907	9 11 0	10 6 0	...	...	3 4 6	3 4 6	10 10 6	0	...	3 6 0	...	...
1908	9 15 0	...	8 10 0	...	3 9 0	3 9 0	10 2 0	0	...	...	...	...
1909	...	...	...	...	...	...	...	...	...	...	...	...
1910	10 3 0	...	...	3 13 0	3 10 6	3 10 6	10 6 0	0	...	...	...	...
1911	10 11 0	...	...	4 1 0	3 11 6	3 11 6	...	...	...	3 5 0	...	...

The cotton manufactures in Central Provinces and Berar
 are given in the following statements
 including quantity of yarn in lbs.
 Outturn,
 (Pounds).

Year.	Quantity of yarn in lbs. (pounds), produced in the Cotton mills.	Quantity of woven goods in the lbs. (Pounds).
1895-96	17,995,301	...
1896-97	17,611,811	5,061,882
1897-98	18,334,320	5,110,292
1898-99	18,807,910	5,156,956
1899-1900	19,752,569	5,261,041
1900-01	18,726,985	5,085,798
1901-02	24,233,715	6,143,908
1902-03	24,306,984	6,646,052
1903-04	24,548,608	7,565,932
1904-05	26,253,834	8,276,682
1905-06	28,367,226	7,938,185
1906-07	26,509,900	7,429,295
1907-08	27,857,536	7,770,752
1908-09	29,773,277	8,922,405

IMPORTANCE OF SMALL INDUSTRIES

AND

Scope for their Development in India.

BY

Rao Saheb Genesh Nagesh Sahasrabuddhe,

Pleader, Ellichpur (Berar).

It is a well established fact that India in olden days was a country which occupied the first rank among the Nations known at the time. She was in the height of civilisation in all its branches. Her material prosperity surpassed that of the ancient Kingdoms of Assyria, Babylon, Greece or Rome. Morality and religion had been so much developed that any common man could well understand the principles underlying them. In industries and commerce, she acted the part and occupied an enviable position as a great centre of the world's commercial and industrial activity. She was the store-house of all important manufactured articles and supplied clothes of finest texture and finish to the then known world. Great and intelligent artisans were born in this land, who manufactured very fine articles of daily use and exported them in large quantities to foreign countries. She was equally advanced even in ship-building and brave and hardy sailors were born, who carried on Ocean Navigation so efficiently, that India was justly regarded as the Queen of the Eastern Seas.

But the wheel of time is now turned. The whole glory of India has disappeared and the country is now dependant for articles of daily use on foreign countries. This statement can be verified by reference to statistics of imports and exports of the country. This turn was expected in the natural course of thing. Various causes, which it is needless to recount here,

have brought about this change. The impact of Western civilisation and the benefits of higher education received under the kind educational policy of British Government, have awakened in the minds of the people, a sense of duty and a knowledge of their position. The rapid rise of Japan from a backward country like India, to a position of eminence in commerce and industry and a close study of the Industrial history of England and especially of America and Germany have given rise to a conviction in the minds of the people, that the salvation of India, lies entirely in its industrial regeneration and development.

It is an admitted fact that the development of indigenous industries and attainment of wealth and prosperity by their means, has attracted the attention of the people of the country. During the last 25 years, various changes of great significance have taken place in furtherance of the interest of the industrial development of the country. Gigantic firms with large capital, have been started to manufacture articles of daily use all over the country with the help of steam and electric power. The premier cotton Industry of Bombay occupies the first rank in the industrial development of the country. Working of Mines and Minerals, sugar Industry, crushing and refining of oilseeds, Tanning and Leather Industries, manufacture of silk and woollen fabrics and hand-weaving are all carried on, on a large or small scale and there seems to be a general activity in the matter of the Industries all over the country. A reference to a few reports on working of the Factories in India will substantiate what I say, and will indicate the vast number of people employed in several Factories referred to above. The following table will show the number of Factories and the people employed in them in Bengal and Burmah :—

Number of Factories 1911.	Number of people employed.	In Bengal.
26	Adults ... ..	...
	Males	8522
	Females... ..	120
		<hr/>
		8642
	Children	163
	Males	<hr/>
	Females... ..	<hr/>
		Total 8805

In *Burmah* No. of Factories

301

No. of Operatives

1,15,624

Rice Mills—165 ; Saw Mills—83 ; Iron and Brass works 11 ;

Total—259.

One Sulphuric Acid Factory, one Tobacco Factory and one Lac Refinery, have been newly opened in *Burmah* (*Vide* Reports on the working of Factors in Bengal and *Burmah*) for the year 1910-11. Besides this, millions of people have been employed in Bombay and Madras Mills and Factories, also in Central Provinces and Berar and in the United Provinces ; and the Punjab and in numerous small Factories and Work-shops scattered all over the country. But the statistics regarding them are not available at present.

Dazzled by the Western civilization and encouraged and stimulated by the enormous profits made by foreigners in England, France, Germany and America in Factories started by them for manufacturing various articles of daily use,—in which crores of Rupees have been invested, the people of this country too were fired with an ambition to open similar large undertakings requiring a capital of Millions of Rupees and carried on by steam and

Influence of Western civilization on Indian capitalists.

electric power. But it may be noted that the conditions of Foreign countries and those of India are quite different in various respects. The people of England and other countries have been striving for the industrial development of their countries for the last 100 years. They have made great self-sacrifice and have now attained a position of great eminence to the industrial world, owing to the various facilities afforded in them, and the sound and practical education imparted in their Technical Schools and Colleges, Laboratories, Schools of Technology and other necessary institutions. They have become experts in every branch of industry and are systematic and honest workers on business lines. They have thus become armed with the most modern and scientific processes of manufacture, can command enormous capital to finance their concerns, and are fortified with high protective tariffs and are ever ready and able to take the least advantage that may offer itself. But the state of India is quite different. It is full of ignorance, conservatism and poverty. The country lacks skill, technical knowledge of the intricate processes of manufacture. Capital is abundant but shy. There is a lack of enterprise and business, ability, and also of honest managers and systematic and earnest workers possessing self-reliance and actuated by notions of self-sacrifice. Under these unfavourable circumstances, is it possible for India to work out industrial concerns with profit, and compete with giant competitors of the world abroad? Admittedly, the situation is very gloomy and one is tempted, through sheer despair to give up every thing for lost.

A glance at the annual reports on the working of Joint Stock Companies in India published by
Failures of big concerns.
 Government will throw more light on the situation and will reveal another disadvantage from the starting of big undertakings. We shall have to note with regret the deplorable failures of some big concerns, which must have brought ruin on many capitalists and poor shareholders. It is difficult to ascertain the exact number of such failures, but it is certain that the failures are many and hundreds of Lacs of

Rupees have been spent in vain, with the result that shareholders and capitalists are disheartened and have no hope or energy left whatever to start new concerns.

Mr. W. S. Hamilton, Registrar of Joint Stock Companies, Punjab, has given a vivid description of these failures, in a paper read before the 5th Industrial Conference held at Lahore in 1909. He says :—

“Some of the grossest of these failures may be known to you. One large Company failed because the Managing Agent decamped owing over a Lac of Rupees to the Company and has not since been heard of. In another case, the Managing Director of a Spinning Mill, went to England for about a year and a half ostensibly to learn higher branches of his business and to buy machinery. He travelled First Class, his board and lodging cost nearly Rs. 6,000 and a pleasant trip to Paris, cost the Company Rs. 200 and all this was shown as an asset of the Company under the head “Machinery”. He brought it is true, some Machinery, but it was not worth its cost to the Company and he certainly brought back Rs. 300 worth of Umbrella cloth as the product of 18 months’ stay in England. Then there was a company which used to show the losses of each year on the asset side of the balance sheet as preliminary expenses which went on mounting up year by year while a profit was shown and the Company was able just before it failed to induce people to take shares by their flimsy mark of prosperity.”

Professor V. G. Kale, M. A., of Fergusson College, Poona, gives his own opinion on “big Factory life” in a paper read before the Industrial Conference as follows :—

“Those who have an intimate knowledge of the social and economic condition of the West, tell us that even there (in England) there is now a reaction against city life, full of hurry and bustle, smoke and squalour, wretchedness and poverty which come in the train of modern factory system and that “Back to land” is the cry often heard at present in some of these countries. A warning is given to us and we are advised

Disadvantages of Modern
Factory system.

to think seriously before we plunge head-long into the life of Manufacturing nations on modern lines. India has been, from time out of mind, a happy land of village communities and republics, leading the life of Arcadian simplicity and its adoption of Western methods must bring upon it all the evils of industrialism, the overcrowded cities with their few Millionaires and myriads of toiling work-people, the struggles between the employers and the employees, with their problems of unemployment, old age pensions, Poor Laws, Factory Legislations and socialism. Sir George Bird-wood in one of his speeches the other day asked "Is Europe going to make Asia East End". The gruesome pictures often presented to us of European industrialism is such as to make us pause and think."

These considerations lead one to think as to the necessity of starting small industries instead of undertaking such big concerns. But some people hold that small industries will not stand in competition with big industries carried on by steam or electric power ; and it is the object of this paper to show and to demonstrate by statistics that small industries have not vanished but have stood the severe test of foreign competition and can yet survive in their struggle with big industries of the world ; and I beg to submit that if I succeed in doing so, I will have done something to encourage small capitalists to open small industries for manufacturing articles of daily use and placing them in Indian Markets for sale.

The task, I have undertaken, is I admit, a difficult one owing to want of reliable statistics and information regarding small industries, especially in this country. By small industries I mean "Industries conducted with the help of steam or Electricity—the number of operatives working in which—do not exceed 20, and which do not come within the scope of the Indian Factory Act, and also such as are carried on by the hand, foot, and animal power".

Factory Inspectors only inspect the factories which come within the scope of the Factory Act and consequently no information or statistics are available as regards small industries. I shall have, therefore, to try to prove my proposition with such materials as are at hand and by referring to statistics on the subject available in India, in England and elsewhere.

I shall first consider the "Cotton Industry", the premier industry of the country and prove as far as possible, the correctness of my proposition. Many Cotton Mills are working in Bombay, Central Provinces and Berar, United Provinces, Punjab, Bengal and Burmah, with thousands of looms and hundreds of thousands of operatives employed and supported by these Mills. Notwithstanding the large outturn of yarn and cloth by these Mills it is a known fact that hundreds of thousands of weavers are still alive and maintain themselves on money earned by the sale of cloths manufactured by hand-loom; I will now demonstrate my point with the aid of statistics and information published in Government Reports from time to time and from records of the office of the Indian Industrial Conference.

The proposition which I am going to discuss in this paper is not a new one. It appears from the
Cotton Industry.

Census figures of 1901 that there are in the whole of India about 27 lacs of hand-loom, weavers of cotton fabrics, supporting an equal number of dependents. To what extent this number has decreased when compared with the number ten, twenty or thirty years ago it is difficult to find. The headings in the Census Tables have changed at each census. The number of hand-loom weavers as a class was never before separated nor does the last census give their territorial distribution. It is, however, a patent fact that the industry has been slowly but steadily declining since the introduction of Manchester piece goods into India. However the figures in the following table are instructive:—

No. of weaver caste.	Province.	Strength in 1901.	Per cent increase or decrease of general.	Per cent increase or decrease of	Percentage of actual.
Koshti ...	Bengal	9,46,463	Plus 4	Plus 18	38
Sali & Koshti	Bombay	1,41,052	Minus 2	Plus 9	63
Koshti ...	Central Provinces	1,360,791			
do.	do.	7,835	Minus 9	Minus $1\frac{1}{12}$	73
Punka ...	Madras	Plus			
Sali ...	do.	3,25,912	Plus 7	Plus $5\frac{3}{4}$	69
Sali-Kori ...	United Provinces	9,230,429			
do.	do.	95,680	Plus $1\frac{1}{12}$	Plus $2\frac{1}{4}$	...
		6,95,216		Plus $7\frac{3}{4}$	...
Mahu ...	Punjab		Plus 7	Plus 4	...

It appears from the above table that between 1891 and 1901 all the weaver castes have held their own in point of population, better even than others, excepting the Kosti Weavers of Central Provinces who lost 15 per cent. against a general decrease in population of 9.5% on account of famines. Curiously enough this is the only caste in which all but 27 per cent have left their ancestral art. The Bengal weavers are next in order of renegades with 38 per cent, while nearly 2/3rd of the weavers in Bombay, still follow the same profession notwithstanding the strongest competition of local mills and foreign goods. The Kosti of the Central Provinces lead all other weavers with 73 per cent, sticking to their traditional occupation. To get an idea of the total production of hand-looms every year is still more difficult. Mr. Robertson says, in his Review of the trade of India in 1904-05, that *the production of cloth by the hand-weaving industry is probably double that of the Indian Mills*. The Mill production of cloth is 15.87 crore lbs. or about 67 crore yards. At this rate, the loom production would be 31.74 crore lbs. or 134 crore yards.

The imports of cotton piece goods into India in 1904-05 were	...	228 crore yards
The Mill production in India is	...	67 crore yards
	Total	...
	...	295 0 0
Deduct exports and re-exports	...	17 0 0
		...
This leaves for consumption	...	278 0 0

The population of India is 29·1/12 crores and allowing 15 yards per head per annum of cotton cloth, which would be a very fair average for a poor country like India, the total consumption would be 442·1/12 crore yards. The difference between this and Mill supply is 164½ crore yards which represent the probable production of hand-loom (Vide Paper read by Rao Bohadur Rawji Bhai Patel, M. R. A. C., Director of Agriculture and Industries, Baroda, before the Indian Industrial Conference).

Mr. A. C. Chatterji, I. C. S. was deputed in 1908 by the Government of United Provinces to enquire into the condition of the local industries and possibilities of their improvement. He has written intelligent notes on the industries of the United Provinces, which are embodied in a report published by Government. A glance at this report will supply ample material to demonstrate my statement. It seems from the report that there is a large industrial population in those provinces, maintaining themselves on small industries producing various sorts of goods and articles manufactured by hand.

Mr. Chatterji writes in the Report as follows :—

“ The Mills of the United Provinces and Ajmer-Marwar wove during the year 1905-06, 76,45,951 lbs. of goods. Supposing roughly, they used seven Million Pounds of yarn (this is fairly a high estimate) about thirty-seven Million pounds of Machine-made yarn were used by the hand-weavers.

Even if we exclude the quantity of yarn spun in the Beawar Mills in Marwar, I think 30 Million pounds may be taken as a safe estimate of the consumption of the Machine-made yarn by the hand-weavers of the province. To get a true idea of hand-loom industry, one should add the quantity of hand-spun yarn used; but no accurate estimate of the latter can be made. The census of 1901 gives the number of cotton spinners as males 20,904 and females 65,645 or roughly 86,000 in all; supposing the average outturn is half a pound a day, and each spinner works about 250 days a year, the outturn is $86,000 \times 125$ lbs. or ten and three million pounds a year. During 1905-06, the United Provinces imported 7,91,000 maunds of European piece-goods and exported 16,000 maunds. The net consumption of European piece goods was thus, 7,75,000 maunds. The imports of European piece goods amounted to 1,11,000 maunds. The bulk of it may be taken to be machine-made cotton fabrics. The total import of machine-made goods therefore came to 8,86,000 maunds. The provinces exported 1,07,000 maunds of Indian piece goods. I do not think it would be an unfair assumption to calculate that one-third of this quantity or 36,000 maunds were the product of Cawnpore Mills. The net imports of mill cloth may thus be estimated to be 8,50,000 maunds or roughly seventy million pounds. To this should be added the consumption of local Mills-cloth. This may be taken as fairly as one Million pounds. The provincial consumption of Mill-cloth (locally manufactured and imported) thus comes to seventy-four million pounds. We have seen above that the consumption of Machine yarn by hand-loom weavers in the province amounts roughly to thirty million pounds. If to this be added hand-spun yarn, the quantity of cloth woven by hand-loom in the province cannot be less than thirty-seven Million pounds. These calculations give one hundred and eleven million pounds of cloth as the total consumption of the Province. This is

equivalent to 2, 3 lbs. per head which does not seem a high estimate. It thus appears that the hand-loom manufacture at least one-third the quantity (by weight) of cloth consumed in the provinces. The hand industry can by no means be said to be insignificant. An idea of its magnitude may also be obtained by considering the census statistics concerning the population connected with the industry :—

Castes.	Actual workers.				Both sexes.	Total workers and dependents.
	Males.	Females.	Males.	Females.		
Cotton weavers...	320,589	154,186	26,383	6,237	4,67,098	9,47,873
Cotton carpet and markers.	3,739	316	52	7	5,264	3,199

Mr. C. E. Low, I. C. S. of the Central Provinces also supports my view and in his report on the industrial survey of Central Provinces and Berars 1908-09 says as follows :—

“The Mill-woven goods amounted to 79,38,185 lbs.=96,807 maunds, which would account for, say, eleven-tenth of their weight in yarn or for 106,487 maunds. This leaves a balance of 221,580 maunds.

The total workers in the hand-loom industry were :—

Central Provinces 184,109

Berars 9,263

which gives 1·66 maunds of miscellaneous yarn per working weaver.

The Mill-woven piece goods produced or imported were :—

Indian Imported	44,546
European Imported	254,321
Indian Local Mill-made	96,807
	<hr/>
Total...	395,704
Deduct exports	71,092
	<hr/>
Net consumption	324,612

The hand-woven goods consumed locally are therefore to the Mill-made goods (allowing for the hand-loom goods unreported) nearly as two is to three." Mr. Low further on says :—

"The foregoing paragraphs afford the main argument for the proposal to assist domestic industries. But in addition to this, there are others. In the first place, the objections to the factory system are doubly strong in a country like India. Family life is the highest and most vivifying principle in the Indian social organisation. The factory system is a foe to it. The centralization of the artisan classes in large towns is more than even undesirable in the trying atmosphere and exigent sanitary conditions of the tropics.

But all these arguments would not avail against the economic necessity put forward with such apparent force by the supporters of the Factory system, in other countries, were it applicable. There is however much reason to believe that in the case of certain industries, it is not applicable. There is great vitality in many of them notably that of weaving and such must continue to be the case so long as machines are dear and Indian labour is still as cheap as it is at present. Again, before all the domestic industries are crushed by the advance of the power mill and the factory, a great change must come about in the system of Indian Rural Economy and there is good reason to believe that such a change will need many years for its accomplishment. These arguments suffice in my mind, for supporting cottage industries even assuming their cause to be a doomed one; but it is by no means certain that it is so. Indeed the results of enquiry go to show that in some cases it.

is a question worthy of consideration and even prolonged experiment at some considerable outlay. whether the cottage industry is likely to be finally ousted by the Factory. In one case at any rate a considerable lease of life, can, it would seem, be assured to a domestic industry, that of weaving, provided its workers adopt a few simple and inexpensive improvements in the appliance of their craft."

A perusal of Mr. Low's report will convince the reader that there are many industries in the country which can be carried on more profitably with a little help from Government and public with the aid of modern methods and appliances. On page 92 of the Report Mr. Low thus summarises his views :—

It is probable that the work undertaken by our experts will attract the attention of local industrialists and capitalists and lead to the founding of small factories for weaving, tanning, pottery and the like. I venture to suggest that the advice of our experts be freely available for the promoters of such undertakings so far as this does not interfere with the performance of their regular work. It should be remembered that the present proposals are not an attempt to assist directly the general cause of Indian industrial progress, but only to help certain classes whose trade is suffering from various causes. But it seems most probable that the industrial regeneration of the country, will have at any rate, its beginning in a *system of small factories* and any action of Government that tends to encourage "such a movement is so much to the good".

There are some advantages and natural facilities in the hand weaving and other cottage industries. The villager combines his industry with other occupation notably agriculture.

Advantages and natural facilities in small industries.

Working at home in the midst of his own family, he is generally willing to and does work longer hours than an operative at a factory does. The women of the family also in the intervals of domestic work give a great deal of assistance in the different preliminary processes between the purchase of the yarn and the actual weaving.

Mr. Chatterji in his report on Industrial survey has pointed out that hand-loom industry is widely distributed throughout the United Provinces. There is no town and hardly a large village—where Julaor or Koris are not found plying their hereditary trade. The courser fabrics made of yarn of counts lower than twenty, are to be met with in all plain districts.

A moist climate is for obvious reasons better suited to the weaving of fine yarn. The following are the factors in favour of hand-loom.

(1) The hand-weavers' plant represents a small capital and can be kept up in use for many years.

The factors in favour of hand-loom.

(2) The nature and amount of labour and dexterity required for the more artistic and elaborate designs of the garments preclude machine competition in such articles.

(3) The strength and durability of course hand-loom article recommend them to the cultivator for their daily use.

(4) The hand-weaver has a comparatively low standard of living and also possesses considerable advantage through his inherited skill in the weaving of fine articles.

Mr. Chatterji's report on the Industrial survey of the United Provinces, discloses to a keen and careful reader the fact that numerous small industries are carried on in those Provinces, which have held their own in the face of competition with foreign goods.

As I have already said, the question of small industries has been discussed by many eminent writers and I will quote a few more expert opinions to strengthen my case.

In a preface to a catalogue of "Sayaji Looms dated Baroda, September 1907", the Manager says as follows:—

Opinion of experts,

"Notwithstanding all its disadvantages, the Indian hand-loom weaving has stood the test of competition with the power-looms so long, that one wonders, how it has done so. The real secret of this is that although his methods are very defective and primitive the Indian weavers' system is the best suited to the country and developed by centuries of experience."

Mr. E. B. Havell, Principal, Government School of Art, Calcutta writes in "Indian Review" dated May 1908, as follows:—

"Loom produced by Messrs. Hattersley was such a wonderful success that it has established a most prosperous hand weaving industry, throughout the Balkan States (numbering some 12,000 looms) and practically driven most power-loom products out of the Market there."

Further in his Pamphlet on ("Hand-loom weaving in India") Mr. Havell states as follows:—

"It is my firm belief that there is hardly a more safe and lucrative field open for Native and European capitalists in India than there is in the development of hand weaving. Hand-loom factories are profitable in Europe. They should be much more so in India, where the conditions are so much more favourable. It is commonly believed in India that hand-loom industry in Europe has been entirely supplanted by power-loom. This is very far from being the case. In France, Switzerland, Italy, there is still a great deal of silk weaving done by hand. In Scandinavia you will find hand-loom in every village and the peasant woman will not only weave their own linen, but spin the thread they require for sewing. In England, the great centre of power-loom industry, there has been lately a remarkable revival of hand-loom weaving. Hand-loom factories are being established everywhere, where formerly every thing was done by the power-loom."

Miss Clive Baby in a lecture before the Society of Arts London, said:—

"The recrudescence of silk trade in the hand branches has drawn its workers away from the congested city streets into the pure air and cheaper regions of Suffolk and Essex, Ipswich, Sudbury and the village round are being centres of renewed activity and if you want hand-weavers, you will find pretty well impossible to get them. Given the possibility of obtaining good weavers in the silk trade the proceeds of Hand-loom Factory are quite as great as those of a steam power Factory. The outlay in the machinery in the latter instance is far greater than in the former and the work of intricate patterns is infinitely superior when placed in the hands of a practised weaver than when entrusted to automatic machinery. Hand-loom firms rarely fail, power-loom firms are not so fortunate in this respect. If the hand-loom can compete with power-loom in England, where the cost of skilled labour is many times greater than it is in India, and where the most perfect weaving machinery worked by steam and electricity is in use, what a much greater prospect must there be first in India where you have an unlimited supply of the most skilful hereditary weavers content with earnings of 3 annas to 8 annas per day. There are splendid possibilities open for the hand-loom industry in India and it is a preventable loss to India that the skilled weavers should day by day leave their looms and add to the already overgrown agricultured population."

Sir Bezanjee Dadabhoy Mehta, Manager, Empress Mills, Nagpur, in a paper read before the Indian Industrial Conference expressed that hand-weaving was capable of competing favourably with power-weaving in a Factory. The Honourable Mr. Chatterton also supports my view.

Professor Radha Kumud Mukerjee, M. A., French and Roychand, Scholar and Professor of Indian History and Economics in the National Council of Education, Bengal, in a paper read before the Indian Industrial Conference, said as follows:—

"The answer has study of the History of the Evolution of industry will reveal the fact not sufficiently recognised, that *Pari*

Pasu with the development of scientific industries, on a large scale there is always a corresponding development of subsidiary, as well as independent smaller industries, including the handy crafts, art industries, and home industries. This is well illustrated in the modern industrial history of European countries, especially those on the continent. In fact it is a fallacy to suppose that natural selection in industrial evolution is only a process of larger organisations, surviving and weaving out the smaller. There is always a place for small industries in the course of industrial development, a place which can never be abolished, but will always grow, simply because it cannot be filled by large industries. Fine arts, decorative industries etc. are again more suitable to hand labour than machine."

Thus the opinions of many more eminent writers well versed in the subject can be quoted to support my proposition; but I refrain from doing so, for want of space. I will now turn my attention to foreign opinion on the question and see what the state of affairs is in England and other countries and how far small industries have held out against the improved efficiency of large scale productions. The task of securing statistics of industries in England and other countries is a most difficult one. Fortunately I came across an article published in the "Nineteenth Century" of August 1900 which has exhaustively reviewed the position of small industries in England and the writer has satisfactorily demonstrated that the small industries have held out against the concerns of large productions. The writer of that article, has drawn his conclusions from figures published in the reports of the Chief Inspector of Factories in England. It seems that great industrialists in England were also of opinion that small industries would soon disappear in the face of large concerns as castles disappear

Opinion in England.

in fairy tales ; but that writer has attempted to remove this impression as far as possible. He has taken an exhaustive review of all textile and non-textile industries and has given reliable figures showing the number of operatives employed in big and small concerns. The following table shows, the importance of British small industries.

1897.	Number of Factories or Departments.	Number of persons employed.	Average Number of operatives.
Textile Factories ...	10,883	10,51,564	97
Non-Textile Factories ...	79,059	27,55,460	35
Workshops ...	88,814	6,76,446	8
Total ...	1,78,756	44,83,800	25

The figures concerning the factories, may be taken as very accurate. But number of workshops is below the real figure. The total number of persons employed in workshops in the country must apparently exceed 1,000,000 and the grand total of industrial operatives in England will thus be raised to something like 4,893,000 men, women, and children; and the conclusion is that about one-fifth to one-fourth population of the industrial workers of Britain, are employed in workshops having on the average less than 8 operatives each. The low averages in the last column of the above table speak for themselves.

Having given general information embodied in the above table, Mr. Kropatkin goes to the detailed information regarding factories and supplies the following figures:—

1895 of	The averages.		
	Number of Factories.	Persons employed.	Averages.
Not less than 500	151	170,982	21
From 499 to 200	1,818	271,652	56
From 199 to 150	1,744	307,381	32
From 149 to 100	1,329	161,476	68
From 99 to 50	1,257	93,305	95
Less than 50	1,034	27,462	171
Total ...	6,603	10,323,328	443

The exact number of factories which employ not less than 1000 persons is only 128 and they employ altogether 355,208 persons out of nearly 3,000,000. On the other hand, another list compiled by the Chief Inspector of Factories shows no less than 34,042 non-textile factories (besides the workshops) in which less than 10 persons are employed. We have thus something like 270,000 operatives and 34,000 employers engaged in the quite small Non-textile industries. The very great and the very small industries nearly balance each other and surely neither Belgium nor France could make a more-imposing show of petty trades. Mr. Kropatkin gives the following list of big and small factories, employing average number of operatives in each industry:—

LIST OF INDUSTRIES.

Name of the industry.	Average number of Operatives.
1. Gas works	... 78
2. Indian Rubber works	... 125

Name of the Industry.	Average Number of Operatives.
3. 456 Glass works	... 87
4. Smelting of metals and conversion of iron	...100 to 400
5. 8318 Foundries and Tiny Foundries	...60 to 90
6. 508 Iron Foundries and Tiny Foundries	... 10
7. Ship-building	...
8. Fabrication of Metallic Tubes	... 23,455
9. Mechanical works of Government	...
10. Alkali Trade	...
11. Fabrication of Matches	...
12. 116 soap and candle works	... 10 men each.
13. 2000 small factories of Chemical Manure and Chemical trade.	20 persons per Factory.
14. Artificial Manure Factories	... 10 men each Factory.
15. 2500 Furniture factories in wood and iron.	10 to 50 persons in each Factory.
16. 4108 workshops for Upholstery.	42,106 people in all.
17. 6500 Factories of Bread, Biscuit, Sugar, Chocolate, Jam and Preserves.	18 Persons in each Factory.
18. 600 Corn flour and grist Mills.	10 persons in each.
19. 2073 Breweries and Distilleries.	10 to 24 persons in each Factory.
20. 3365 Factories of Aerated waters of which 2000 are small industries.	Operatives employed in all are 37,000.
21. 104 Calico Printing	... 170 to 700 employees in each Factory.

Name of the Industry.	Average Number of Operatives.
22. 2500 small industries of Bleaching, dying, calendering, finishing, hooking or lopping, making up, and packing yarn and cloth.	Giving employment to 1,000,000 people.
Out of this 500 are small Industries ...	10 persons in each are employed.
23. Fabrication of ready made clothing linen, shoes and boots, and hats and gloves.	80 to 150 people are employed in each Factory.
24. Fabrication of Gunpowder and explosives.	12000 persons are employed in all.
25. Hardware Trade-fabricating of cutlery tools and agricultural Machinery.	More than one million British workers.
26. 500 small Factories for Fabrication of locks.	4000 workers in all.
27. Bits and stirrups, Gardening tools.	All these are pretty trades.
Hygienic appliances, small things in Brass tinplated and galvanized iron and other metals and Alloys.	10 persons in each Factory.
28. Agricultural Machinery works.	32 persons in each Factory.
29. Galvanizing, enamelling and finishing of metals.	28 men in each Factory.
30. Pins and Needle Factories..	43 men in each Factory.
31. Various Tools work ...	25 do.
32. Boiler Making works ...	48 men per Factory.

In these various branches
we find 104,000 persons

Name of the Industry.	Average Number of Operatives.
	distributed in more 3,000 small Factories to which 7,500 workshops with 60,000 persons employed therein must be added.
33. Cycle making in 1780 Factories and workshops.	46,000 people are employed in all.
34. Electric work ...	10 persons in each Factory.
35. Wire drawing, nails and screw works, small Forges, ship and boat building, materials for building trade are forged either by hand or small Machine.	In short 1/3rd of the all workers employed in Non-textile industries and this third means 830,260 persons, find occupation in the wide classes of machine appliances, and tools which comprise 14,899 factories, for which the average number of workmen is 56 per Factory.

Small and Tiny Factories.

36. Jewellery, silverplated and electroplated goods, watches, photographic requisites, toys etc.	54,000 persons are employed.
37. Small factories of wood work, tanneries, work in which bones and ivory are	2,60,000 working men are employed and employers are 11,200. The lista-

Name of the Industry.

Average Number of Operatives.

shaped into thousands of forms, bricks, tiles earthenware and China works.

of Mr. White Legge which give factories employing less than 10 persons, contains thousands of small establishments.

6,000 Factories.

- | | |
|---|---|
| 38. Printing, Lithography and book-binding. | 1,20,000 workmen in all. |
| 39. 4,219 Printing Establishments. | Less than 10 persons are employed in each. |
| 40. Fabrication of brushes, ropes, sails, baskets, fancy articles in leather, paper, wood and metals. | 1,30,000 workers.
4,300 employers.
The total comes to 1,200,000 people working in small and petty trades. |

All Factories mentioned above use some sort of Mechanical (steam, gas, oil, electrical) power. But the sub-division goes further which includes the following :—

Hand Industries.

- | | |
|--|---|
| 41. Baker, tailors, shoe-makers, small village carpenters, wheel wrights, smiths. } | One million people are employed. |
| 42. 1,200 work-shops, Hosiery, lace weaving ... | |
| 43. Making of carts and coaches. | 20,000 persons are employed and 60,000 in other hardware works. |
| 44. 48,425 workshops for Millinery-tailoring, shirt-making, boots and shoes, gloves, artificial flowers making &c. | 3,51,000 to 50 people in each workshop. |

The writer cannot guarantee the accuracy of the above figures, but they give an idea as to the great industrial activity in England and the importance and extent of the small industries.

Mr. Kropatkin has given a lively description of a 'Tenement
Tenement Factories in
 Sheffield.
 Factory' in Sheffield which, I am sure, would be found interesting as well as instructive reading:—

The "Tenement Factory" is habitual. A small foundry in the middle of the yard, the four sides of which are occupied by hundreds of small workshops, supplied with motive power from a central steam engine and these workshops are rented and sub-rented by the small masters. In Sheffield there are now about 170 such tenement factories. In some there are as many as 70 to 80 separate rooms or grinding Halls; in others many less. There are approximately 2,900 occupiers who are first tenants, many of these sub-letting part of the rooms. In such tenement factories, you see rows of small rooms, two yards square in each of which one man, standing between his fire and his anvil, makes knife-blades, further on you find rows of workshop of the capacity of a good sized parlour; in each of which a master works with his few aids, making all possible, continually varying sorts of tools; and on the ground floor you discover equally small damp rooms, in which saws and files are fabricated; or slightly larger rooms, in which tools are polished and ground. About 15,000 men are employed in these tenement factories, making these tools and knives, which make Sheffield one of the most widely known towns in the world.

The dry figures mentioned above, gives the following result:—

Total working population.	Employed in large factories of more than 500 operatives.	Employed in middle-sized factories and Government workshops.	Employed in small factories and workshops.
4,800,000 ...	$\frac{1}{8}$ of the population ...	From $\frac{3}{8}$ to $\frac{1}{2}$ of the population.	Nearly $\frac{1}{2}$ of the population.

The thousands of small things which we require in our daily life are made chiefly in those busy agglomerations of small industries, and judging from what we know of other countries we may surmise that the *aggregate value* of all that *is produced in the small industries* in Britain, *must not be very much below the aggregate value of what is produced in the large factories.*

The review of small industries in Great Britain made by Mr. Kropatkin is exhaustive. A reader who will take the trouble of going through its pages will find it a very instructive reading and will be convinced of the truthfulness of my assertion.

He concludes his review in the following words :—

“ As to the current idea about the necessary disappearance of small industries, we see that it falls through, as soon as we go to the facts of real life. Only a superficial “bookish” acquaintance with industry could permit the economists to assert that “Law” for half a century without ever attempting to prove it. The more one examines into the present state of the small industries in this country, the more one is inclined to think, on the contrary, that they have been steadily developing and conquering new fields for the last fifty years. The petty trades are not killed and *cannot be killed* ; like “ Proteas ”, they ever change their aspects.”

Prince Kropatkin's opinion on small Industries.

So far I have shown the importance of small industries and their holding power in competition with industries of large production. Let us now examine the feasibility of the proposition from the point of view of the principles of Political Economy.

Messrs. Adam Smith and Mill are old writers on "Political Economy" and Mr. Charles Davis is a modern writer. The subject is exhaustively discussed by Mr. Mill in his treatise and some quotations from it will be found interesting :—

"There are some advantages of Joint Stock over individual management. But if we look to the other side, we shall find that individual management has also very great advantage over Joint Stock. The chief of these is the much keener interest of the Manager in the success of the undertaking." * * *

"The successful conduct of an industrial enterprise requires two distinct qualifications, fidelity and zeal. The directing mind should be incessantly occupied with the subject, should be continually laying schemes by which greater profit may be obtained or expenses saved. Small gains or profits ought not to be disregarded—which is generally the case in large concerns. Because small profits, often repeated, amount to great gains."

The current English opinion is in favour of large forms. On the continent the weight of authority, seems to be on the other side, Professor Raw of Heidelberg, lays it down as a settled truth that small or moderate sized forms yield not only a larger gross, but a larger net produce, though he adds, it is desirable, "that there should be some great proprietor to lead the way into new improvements". Mr. Charles Davis has also discussed the subject in his new book, and his opinions are not different from those of the old writers. The following quotation from Mr. Davis will not be found out of place :—

"There seems a permanent field open for small masters in subsidiary trades such as blacksmiths, Bellhangers, Plumbers, Glaziers, Carpenters, sweeps or house painters and in satisfying wants that

require scientific or artistic skill, wants ever multiplying in a highly cultivated society and the ease of obtaining technical information by means of trade journals, technical schools, and the transmission of patterns and samples, tells in favour of small dealers and manufacturers and above all the development of transmission of power, allowing small motors to be chiefly multiplied and energy to be decentralised."

So between 1880 and 1890 the Hydraulic transmission of power from the rapid Rhone saved the watch and jewellery trade of Geneva. A much more important and wide spread of auxiliary and small scale production, appears to be the electric transmission of power, first-made practicable about 1891 and supplied for example to the hand-loom of ribbon-manufacturers of St. Etienne. (See Prince Kropotkin in the "Nineteenth Century" August 1898 and again August 1900 where he shows the persistence of small industry in England).

The conditions of climate when a long winter blocks all agricultural work, for many months, seem favourable to small industry. This is one reason of the Swiss house industries, in spite of the competition of factories, and a still more conspicuous instance is that of Russia, where in recent years *pari passu* with the marvellous development of factories, there has been no less marvellous development of village industries. "Among them are to be found weaving of every description of cotton, linen wool and silk, leather work of every sort, shoe-making, tailoring, wood work of every kind, from boat, cart and sledge building to the construction of furniture of great value and of highly artistic and original designs; metal work of almost every description from cooking pots &c. to the construction of small machinery, especially knitting machines, portions of which are supplied to them in a more or less finished state by German and Belgium houses, Cutlery, agricultural implements, pottery and utensils of all kinds needed for local use. Besides all these there is an immense number of articles that might be grouped together as "Bazaar goods"—toys, pipes, cigarette-holders, boxes carved and enamelled, many of great beauty, musical in-

struments and carved wooden, bone and horn objects of almost every kind. Besides, the large amount of these goods required for the internal trade of the country, many are exported chiefly to Persia and the Asiatic dominions of Russia while, of late years, new markets have been found for many of them within the Chinese Empire.

From the above quotations of old and modern writers on Political Economy, it is clearly evident that small industries have held their own against industries of large productions of course in certain branches. Mr. Charles Devis has given a lively description of small industries carried on in Russia.

Technical Education is as much necessary for conducting small industries as in the case of big ones.

Technical Education. The crying need of India is technical knowledge amongst its work-people, managers, and even I may say, amongst capitalists.

Technical Education embraces three main heads, *viz.*, *Agricultural, Industrial and Commercial Education*. Agricultural Education is concerned with the production of raw materials of commerce. Industrial education is concerned with the conversion of raw materials into manufactured products, while Commercial Education is concerned with seeking out markets for commodities and finding purchasers for the products of agriculture and industry. (*Vide* "Commercial Education" by Mr. K. Subramani Aiyar, F. S. A. A.) Experience has shown that even the capitalists and managers must have sufficient knowledge of technicalities of an industry and its intricate processes. There is no use of dependence on employees. Honesty and the principle of "true to salt" should be firmly inculcated in the minds of work-people. They should be made clearly to understand what is meant by "duty and responsibility" and the effects of not doing duty properly and honestly on themselves, on their employers and even on the mother-country. In short "duty" should come to be looked upon as Religion and God. The system of Primary Education should be so changed

as to include in its programme principles of morality and religion. Industrial progress has in all countries been from workers upwards and not from College downwards. Care must be taken to see that working people and their children receive proper education and that they understand their own situation and the position of their masters and forget self-interest to some extent and are imbued with patriotism. Until working classes show a disposition to acquire and to utilise better knowledge of their work success in a concern is hopeless. The instructor should impart such knowledge as the children will find immediately useful, when they go to work either in the field or in the workshop. Children should be taught to think rationally in the school, so that they will continue that habit during the rest of their life. What is most wanted is men whose hands and eyes have been trained to do work correctly and methodically and who have got experience and expert knowledge of the detailed processes of manufacture.

To prepare work-people of the type described above, Government aid is urgently required. British Government has already done much in the matter to Technical Education in India. A glance at the *Directory of Technical Institutions in India* compiled and published by our energetic General Secretary of the Indian Industrial Conference, the Honourable Rao Bahadur Mudholkar, will justify what I say. Agricultural Colleges and Research Institutes &c. with experts at their heads, have been opened, and Technical Institutions established in a few important centres in India. The Government also intends to create Faculties of Commerce in all Indian Universities; at least the question has been taken up by the Bombay University.

But more Government help is needed to encourage small industries, and such aid will, it is hoped, be given by our parental Government in the near future, as rightly said by the Honourable Rao Bahadur Mudholkar in his address delivered at the Fourth Indian Industrial Conference held at Madras in 1908 :—

Necessity of
Government aid,

“The first thing that has been done is to recognise the fact that some education is necessary even for workmen and artisans and that our industrial development cannot be said to be established on a solid foundation unless the mass of operatives, on whose labour it would depend, are better fitted physically, intellectually, and morally for their work than at present. The Government have to do the same duty and responsibility in regard to the instruction of the masses that they have in England and we are justified in appealing to them to take here the action which is deemed absolutely necessary in Great Britain.”

The writer has got a bitter experience of a big concern with which he was intimately connected.

Writer's conclusions.

Experience shows that the people of our country are not yet quite fitted for undertaking large concerns barring the cotton mills and a few other successful industries like Messrs. Tata and Sons' Iron and Steel Factory. Many necessary qualifications are still wanting in the people and it is therefore risky to go in for large concerns. Failures are many and the losses sustained by the people are enormous. India is yet in a state of infancy as regards industrial organizations, and it is advisable to make a beginning with small industries. Of course I do not mean to say that concerns of large production should not be started when all the circumstances are favourable; or the small industries would always stand in competition with large undertakings. What I mean to say, is that there are many industries such as fine arts, decorative industries and others, which if conducted even on a small scale with the help of Modern Machinery and appliances can be successful and profitable. The big concerns may be started by these, who are in a position to do so, intellectually and financially. The capital is abundant in the country but shy. There is a lack of enterprising spirit, and managing abilities, as well as technical knowledge of intricate processes and methods of manufacture. The small industries have held their position in their competition with concerns of large productions, as will be clearly seen from what I demonstrated above. So that there ought to be no scruples or apprehensions on that point.

There should be a net work of small industries all over the country, like Tenement Factories and other organisations in Germany, France, Italy and England. Small industries are bound to succeed provided they are carried on with tact, honesty, intelligence and foresight with the help of modern machinery and appliances and according to modern approved methods. Products of these industries should find market at once with the help of selling Agencies, which seem necessary and indispensable.

In their infinite, ever changing, and ever increasing variety—the small industries are a necessary supplement to the great staple industries; there is a vast field for them. For the improvement of various existing industries which can be carried on even by small capitalists, I would make a few suggestions. The following steps should, in my humble opinion, be taken for the improvement of agriculture :—

(1) Agricultural experts should be appointed for each District. They should go round villages; Writer's humble suggestions. mix and talk with cultivators on terms of equality and learn their difficulties and instruct them as to how to remove them.

(2) Improved Agricultural Machinery and Appliances should be stocked in each District for sale at a cheapest possible rates.

(3) Night classes should be opened in each important village, where general education should be given and methods of agriculture taught to cultivators.

(4) Programme of primary education should be so changed, as to include in it elementary lessons on agriculture.

(5) Advantages from manures, and ravages from insects should be demonstrated in experimental farms, at each District and cheap manure shops or dépôts should be opened at each village and instruction given regarding methods of preparing manures.

The writer admits that he claims no originality in whatever stated above. He has only attempted to demonstrate the significance of small industries. The writer indeed will be very glad, if on perusal of the paper, small capitalists will come forward and invest money in small concerns and conduct them on the lines mentioned above. A net work of small industries all over the country, will afford employment to millions of poor people who will thus be able to maintain themselves, comfortably and lead a happy life in their homes.

APPENDIX A.—LIST OF INDUSTRIES.

- | | |
|--|--|
| 1. Mica Industry. | 23. Hand-loom Industry. |
| 2. Resin Turpentine Industry. | 24. Manufacture of sugar. |
| 3. Gum Industry. | 25. Fret work and picture frame making Industry. |
| 4. Fruit Industry. | 26. Pisciculture or Fish rearing Industry. |
| 5. Galvanised Iron Tubs. | 27. Coconut Fibre and Rope making Industry. |
| 6. Powdered Milk Industry. | 28. Pencil making Factory. |
| 7. Apiculture or culture of Honey. | 29. Plantain cultivation and fibre Industry. |
| 8. Shellac Factory. | 30. Washing Factory. |
| 9. Citrus Industry. | 31. Glass paper Industry. |
| 10. Button Factory. | 32. Paper and paper-pulp Manufacture. |
| 11. Glass Factory. | 33. Manufacture of scents. |
| 12. Manufacture of steel Pens. | 34. Manganese Industry. |
| 13. Prussian Blue. | 35. Cotton-seed, Linseed oil and other seeds Industry. |
| 14. Imitation Ivory. | 36. Weaving Industry. |
| 15. Match Factory. | 37. Imitation Pearl Button Factory. |
| 16. Wooden, paper or clay Toys Factory. | 38. Imitation Ivory from Potatoes. |
| 17. Basket making and the making of furniture from Bamboo such as chairs &c. | 39. Manufacture of Vegetable Butter. |
| 18. Handkerchiefs Manufactory. | 40. Sheep-breeding. |
| 19. Stockings and gloves Knitting Industry. | 41. Oyster-culture Factory. |
| 20. Condensed Milk Industry. | 42. Cane and Rattan work. |
| 21. Cigarette and Chirut making Factory. | |
| 22. Soap Factory. | |

LIST OF INDUSTRIES—(*contd.*).

43. Photography.
44. Leather or Chrome Tanning and shoe Factory.
45. Rubber Industry.
46. Enamelling on Gold or Copper and Lacquering and metal Polish.
47. Pin and Needle Factory.
48. Poultry Industry.
49. Rat skin Industry.
50. Snake skin Industry.
51. Blacking for Harness, Boots, Shoes and Leather Goods.
52. Polish for marbles, Horn bones iron, steel and other furniture.
53. Manufacture of Alcohol and Sulphuric Acid.
54. Varnish Manufacture.
55. Manufacture of Inks.
56. Ice and Soda-water Industry.
57. Dairy Industry.
58. Manufacture of Mirrors.
59. Lace Industry.
60. The Gut Industry.
61. Pine-apple Industry.
62. The Gourd (Bhopla) Industry.
63. Tile and Brick making Factory.
64. Waste paper Industry.
65. Manufacture of Umbrellas
66. Manufacture of Artificial manures.
67. Castor oil Industry.
68. Manufacture of German Silver.
69. Boot and Shoe Factory.
70. Human Hair Industry.
71. Snuff Manufacture.
72. Cements of various kinds
73. Perfumery.
74. Extraction of Essence from fruits and flowers &c.
75. Rope making Industry.
76. Candle Manufacture.
77. Card-Board box making Industry.
78. Envelope and letter-paper Industry.
79. Metal sheet making Industry.
80. Manufacture of earthenware.
81. Aloe-fibre Industry.
82. Manufacture of Brassware.
83. Duck-Rearing Industry.
84. Comb Manufacture.
85. Cutlery work.
86. Electric Lighting.
87. Making felt for hats.
88. Refining Indian oils.
89. Preparation of Turpentine.
90. Case in Industry.
91. Carpet Manufacture.
92. Sandalwood Industry.
93. Musical wires and Lacquering work Industry
94. Gas-works.
95. Iron Foundries.
96. Fabrication of Food stuffs.
97. Manufacture of Agricultural Machinery.
98. Fabrication of Locks, Latches, Screws, Nails &c., &c.
99. Book-binding.
100. Fabrication of Brushes, baskets, sails and fancy articles in Leather pa-

LIST OF INDUSTRIES—(*contd.*).

- | | |
|--|--|
| per ; wood and metals.
101. Manufacture of Clocks
and Watches.
102. Electric Lighting and
other connected Indus- | tries.
103. Shorthand-writing.
104. Typewriting.
105. Printing. |
|--|--|

CHEMICAL INDUSTRIES.

- | | |
|--|--|
| 1. Heavy chemicals as acids
and alkalis.
2. Fine Chemicals, as salts
and other chemical
products.
3. Mineral colours.
4. Aniline colours.
5. Coal Tar Colours.
6. Dyeing and Calico print-
ing.
7. Pigments, paints, varni-
shes.
8. Essential oils.
9. Essences.
10. Soap, glycerine and
lubricants.
11. Illuminating gases.
12. Coal tar distillation.
13. Pharmaceuticals.
14. Petroleum refining and
Bye products, | 15. Candle making.
16. Explosives.
17. Photography.
18. Glass-making.
19. Porcelain and Pottery.
20. Cements.
21. Enamel wares.
22. Bricks and Tiles.
23. Rubber-making.
24. Paper.
25. Starch.
26. Sugar.
27. Wine brewing.
28. Distillation of spirits.
29. Wood distillation, Vine-
gar &c.
30. Fertiliser and manure.
31. Leather tanning and
dyeing.
32. Metallurgy.
33. Electro-plating. |
|--|--|

INDUSTRIES FOR WOMEN.

- | | |
|---|--|
| 1. Domestic Economy and
Management of the
house.
2. Cookery.
3. Laundry work.
4. Dress cutting and Sewing
and other needle work.
5. Household Hygiene. | 6. Dairy work.
7. Embroidery work.
8. First aid to patients and
cure of children.
9. Elementary drawing.
10. Home knitting.
11. Midwifery. |
|---|--|

**APPENDIX B.—LIST OF TRADE AND INDUSTRIAL
JOURNALS IN FOREIGN COUNTRIES.**

Subject.	Number of Periodicals.
Trade, Paper, Advertising Agencies	4
Trade and Technical Reviews	7
Typography, Printer, Printing	27
Postal	36
Insurance	4
Advertising	68
Newspaper makers	15
Typewriter	1
Import, Export	54
Hotels	26
Dairy, Hay, Grain, Produce	57
Fertilisers	4
Petroleum	23
Wine, Cider, Spirit, Distillers	104
Beer, Brewing, Bottling, Hops, Malt, Mineral Waters	64
Grocery	61
Cooking, Food, Table	32
Merchandise and Grocery	44
Fruit, Vegetable	18
Baskets, Barrels, Bags, Boxes, Crates, Packages	14
Brooms, Brushes, Cordage, Cork, Handles	7
Canned Goods	3
Boots, Harness, Gloves, Leather, Saddlery	83
Sugar, Molasses	42
Carpentry	8
Paper, Stationery	38
Cotton, Wool	74
Dyers, Dyeing	19
Dry Goods, Cloaks, Furs, etc.	15
Hats, Caps and Millinery	18
Tailor, Draper, Haberdasher	24
Furniture	20
Carpets, Curtains, Wall Papers, Upholstery	10
Salesman	4
Mail Order	3
Accountant, Business, Book-keeping, offices	11
Gas, Water Fixtures	45
Jewellers, Clock, Watch, Optical trades	44

Subject.	Number of Periodicals.
Flour, Meal, Milling	48
Music, Music Trades	81
Maritime Shipping	73
Street Railways	20
Rice, Starch, Macaroni	3
Soap, Tallow, Candle, Perfumery, Toilet Articles	14
Tea, Coffee, Spices	10
Naval stores	2
Bakers, Cocoa, Confectionery	53
Board of Trade, Chamber of Commerce	14
Invention, Patents, Trade Marks	20
Cigars, Tobacco	49
Cold storage, Ice, Refrigeration	12
Butchers, Drovers, Provision	32
Fish, Fishing, Fish Hatchery	23
Laundry	13
Coal, Coal Mining, Fuel	19
Irrigation, Drainage	4
India-Rubber, Celluloid, Guttapercha	7
Municipal Engineering	9
Oil Paints, Painting	17
Drugs, Chemical, Pharmaceutical	71
Automobiles, Motor Vehicles	54
Cycles	14
Blacksmith, Carriages, Wheelwright	19
Chinaware, Pottery, Glassware	18
Cement, Clay, Brick, Lime, Slate, Stone	41
Florist, Landscape, Gardening	6
Sewing Machines	7
Undertaker	8
Machines, Mechanics	27
Steam Engineering	13
Engineer, Engineering	31
Marine Engineering	3
Farm and Implements	14
Hardware, Kitchenware Machine Tools	29
Iron and Steel Foundry, Metallurgy	45
Electric Telegraph, Telephone	84
Railways	79
Bee, Honey, Wax	74
Architecture, Building Contracts	68

BANKING IN INDIA.

BY

C. Gopal Menon, F. I. P. S., F. C. I., A. I. B.

A country derives from a widespread system of banking, facilities for the collection and distribution of capital according to the requirements of different localities. And this is a supreme service that is rendered by the banking community to the economic development of a nation. It is only by the capital commanded by the banks in Europe and America that enormous commercial and industrial enterprises have been rendered possible in those countries. For the man in the street, banking has very little to do with the production of wealth; but when the economic effects of Bankers' advances in Western countries are examined, it will be seen how much their enterprise and their efforts owe their success to the circulating capital provided by banks for industry and commerce. It is mainly by the development of banking that the systematic lending of capital by one man or body of men to another can be provided. An examination of the growth and development of the industrial progress of England and America would reveal the fact that much of these during the last one or two generations is due to their banking systems. A very large part of the capital which in the modern organisation of trade is loaned through the agency of banks will, without the agency of the banks, not be loaned at all, while the endeavour of individual lenders to deal with individual borrowers without the agency of a professional intermediary, such as a Bank, would result in losses leading to the detriment of the thrift and industry of the community. At the close of 1911 it was estimated that the deposits and note circulation of the Banks in the United Kingdom amounted to £1,043,000,000 and of this sum £648,000,000 was lent to facilitate the trade of the country by way of advances and the

discounting of Bills. The total capital and reserve of the banks amounted to £133,000,000. But for this help rendered by banks, it would not have been possible for men, who have practically started with infinitesimally small capitals, to be now conducting huge business with enormous capitals and become the wealthiest men in the world. Now in India we are trying to build up capitalist industry ; and if it is to achieve eminence and success, it is necessary to ascertain the secret of Western methods of production. The economic life of England until the close of the 18th century had attained but little success, partly due to restrictive legislation and partly to want of mutual confidence. But when corporate and co-operative enterprise began giving birth to such huge undertakings as the Bank of England, the East India and Hudson Bay Companies and a multitude of Joint Stock Companies, not only many economies accrued to the democratic structure of the business, but those concerns commanded better credit facilities.

In his book, "The Modern Bank", A. K. Fiske says :

"The bank is the most important instrumentality in the modern system of commerce, and trade. Without it this system could never have been developed, and could not now be maintained without it. It makes possible the immense scale upon which labour is divided and applied to a multitude of processes upon which mechanical appliances, for saving labour or increasing its effect, can be used ; upon which the work of transportations and distribution can be carried on ; and upon which the interchange of commodities for the satisfaction of the wants of man can be effected. The scale of co-operative activity results in obtaining from the natural resources of the earth a volume of products far beyond that would be conceivable without it ; and this abundance of production from human effort raises immeasurably the level of human well-being. It has been the chief motive power in the advance of material civilisation in the last century, and it has been made possible by the devise of banking."

Here, in a nutshell is described the part played by banks in the promotion of wealth. It is the increased banking facilities that promote enterprise in the business world and thereby aid industrial development. That there is ample room for the development of banking in India on Western lines may be seen from the fact that with the growth of commerce and industry within recent years there has sprung up a number of banking institutions solely controlled by Indian capital. Besides the three Presidency banks and ten foreign exchange banks there are about 16 Indian banks started within the past few years. Presidency banks have a paid-up capital of about 4 crores of rupees together with a reserve of $3\frac{1}{2}$ crores of rupees. Public deposits in these banks amount to about $3\frac{1}{2}$ crores and the private deposits about 35 crores. The exchange banks with their head offices in London and other places employ a capital of about 18 million pounds, but it cannot be ascertained with certainty how much of these is employed for financing trade in India. The deposits in these banks may be estimated at about $19\frac{1}{2}$ crores. The Indian Joint Stock Banks have comparatively small amounts of capital and the deposits amount to about 16 crores. The grand total of bank deposits, excluding the public deposits of three and half crores in the Presidency banks is therefore $70\frac{1}{2}$ crores. Mr. Reginald Murray, in his paper read before the Indian section of the Royal Society of Arts in January 1911, estimated that the total increase of deposits in banks in India within the last twenty years has been not less than Rs. 63 crores.

This increase goes to prove that the people in the country are bringing out more and more of their money utilised in other ways for investment in banks. No doubt that in addition to these depositors there are a large number in the Post Office Savings Bank. But the people who have now deposited money in Joint Stock Banks are still inadequately small in comparison with the total population.

We want to see more capital organised and employed for productive purposes, say for the development of the material

resources, industrial and manufactures. More capital is required to finance the ever-growing foreign and home trade. The best known method of exploiting capital is by the extension of the Joint Stock Banking system, because it is only by this system that capital can be automatically concentrated and distributed. An examination into the returns of the larger Joint Stock Banks in England show greater profits in proportion to their paid-up-capital than the smaller ones, and that the deposits of the former exceed their paid-up capitals much more in comparison than is the case with the latter. It, therefore, follows that the profits of a bank do not depend on the *amount* of paid-up capital, but rather upon the relative proportion of "deposits" to paid-up capital. The deposits of the large "Joint Stock Banks in England have increased enormously, their earning capacity has likewise increased and consequently their dividends also."

The fact that the banks worked on Western methods are increasing in India and that there is a tendency for other kindred institutions to come into existence is, no doubt, a significant factor bringing about future development. The primitive system of shroffing appears to be gradually falling into disuse and its place is being taken up by banks on modern lines.

It is difficult to contrast the banking system in India to-day with that which existed prior to the settlement of the English owing to lack of detailed information as to the system under which it was carried on by the Indian banker. We have no systematic records from which to obtain the information. It is difficult to trace the history of the higher classes of Bankers during the periods of Hindu and Mahomedan rulers just as one can narrate to-day the origin and growth of some of the private Banks in London. Bankers have always been important members of Indian Society. No Royal or Imperial Council was complete without having on it a representative Banker. The higher classes of Bankers were invested with the powers of Ministers of State. The land revenue paid in kind and which could not be accommodated

in the royal or imperial exchequer, was collected by the State Bankers for the purpose of converting the same into useful form, and to make these resources readily available for State purposes. Money lending was not the only business done by them; the issue and discounting of bills of exchange were always largely engaged in, and appear to have been attended with but small loss if any. Deposits and the issue of paper money were also in vogue with them, the profits made on deposits from the high rate of interest charged were enormous. The Indian Bankers, according to Mr. C. N. Cooke, may be divided into three classes:—The city shroffs, the Zillah Bankers and the Village Mahajuns. “The first are chiefly engaged in exchange operations in dealing with the public stock, and making advances on securities to commercial establishments. They possess extensive credit throughout the country, and comprise some of the most honoured names in Indian society. The second are the depositories of the monied wealth of the landed families or their creditors, and have a close connection with the internal trade of the country, in which they are often found engaged directly on their own account. The character and functions of the third are well-known. In the North Western Provinces, the Village Mahajuns are owing to the impoverished condition of the agricultural classes and to the severity of the operations of the revenue laws upon them, a thriving, in fact the only thriving class. In Bengal, every man with a little spare cash is a Village Mahajun, of these several classes, the one which is most directly useful to the community is the class of Zillah Bankers. Their close connection with the landed interest and the assistance they afford towards the exportation of the superfluous produce of the interior districts of the country, give a peculiar value to their service. They form efficient props to the fortunes of the landed families which connect themselves with them, and have frequently rendered important aid to the Government.” The most wealthy

are to be found settled in Calcutta, Dacca, Patna, Benares, Mirzapore and Bombay.

The rates charged by these bankers appear to have been 30, 40 or 50 per cent. for the money lent to them, and they did not always stipulate for payment in coin, but often received the interest in the shape of grain or cotton &c. They were, however, looked upon as perfect types of commercial morality; the dishonoring of a *hoondee* was an event of rare occurrence with them. Their business was carried on by clerks holding responsible positions in the firm. They were poor men but were never called upon to furnish any security. Their remuneration was not high, and yet they were charged with the power of transacting all business in the absence of the members of the firm. The system of account-keeping adopted by these bankers was so simple and accurate, that they could at any time strike the balance of a deposit account without any trouble. Their system of interest calculation was so accurate and expeditious that it has elicited the admiration of several European Bank Managers and merchants.

Paper money, whether in bills or notes, formed only a very small proportion of the Indian circulation. Hoondee or Bill of Exchange, has been known to Hindas from very remote periods. Shroffs are said to have employed correspondents in all the great towns of Hindoostan, and even in Cashmere and in some parts of Persia, and they were ready to purchase these Hoondees wherever offered for discount. Notes payable to bearer on demand were practically unknown in those days.

Such in brief is the account of Indian Banking prior to the advent of the European system, first introduced by the Agency Houses of Calcutta. Some of the European merchants of that city recognising the rich fortunes to be made out of banking business began to open current accounts and began to do a regular banking business. To quote Mr. Cooke, "They were agents for the whole Civil and Military Service. They were agents for the planters and merchants settled in the Upper Provinces. They were bankers receiving deposits, bankers making advances for the produce of the interior, and bankers issuing paper money. They had a note circulation which was extremely beneficial to them in carrying on their diversified operations as ship-owners,

“house-owners, farmers, manufacturers and money-lenders.” They also acted as agents for the European planters and merchants settled in the country. Some of these merchant houses did a splendid banking business and their transactions involved the turn over of several crores. But the commercial crisis at the beginning of the last century wrought so much havoc upon several of these merchant princes, that they were compelled to suspend payment, and their place was taken up by Joint Stock Banking Companies. It is said that the Agra and United Service Bank, Limited, established in 1833, was an association formed on the debris of the great Calcutta Agency Houses. This bank worked only for a short period, but it was afterwards developed and started under the style of the Agra Bank, Limited.

The failure of the great agency houses of Calcutta and the consequent distress brought upon the country gave rise to “Chartered or Government Banks, more widely known as the Presidency Banks of India—the Bank of Bengal, the Bank of Bombay, and the Bank of Madras. The further treatment of the subject shall be made in four main divisions, *viz.*

- (1) Native Bankers.
- (2) The Three Presidency Banks.
- (3) English Exchange Banks.
- (4) Indian Joint Stock Banks.

Native Bankers, such as Nattucottai Chettys, Sowcars and others not only do a large money lending business, but are also receiving deposits and are often selling drafts, for the transfer of funds from one point to another, as the internal trade of the country demands. Their operations are for the most part confined to the locality in which they do business but from time to time they purchase and sell Hoondees to the English Exchange Banks, for the transfer of funds from one place to another. Some of these bankers have branches in far off places, say, in Singapore, Penang, Hong Kong, Shanghai and even on the frontiers of India. They cannot, however, be said to be doing a banking business in the sense in which banking is really understood, their business being mostly money lending on the mortgage of jewelery, goods and other property. They also lene

money to the agriculturists but since of recent years these have been resorting to the Co-operative Banks for help.

The second category are the Presidency Banks of India. The Bank of Bengal had been granted a charter as early as 1809 with the exclusive privilege of note circulation, but this was withdrawn in 1862 the year in which the Paper Currency of India, otherwise called the Currency Note Issue, was introduced as a part of the monetary system. The Bank of Bombay and Bank of Madras were established in 1840 and 1842 respectively. The constitution and management of these banks are regulated by the Presidency Bank Acts, first brought into effect in 1867 and renewed in 1876 and finally in 1907. These institutions are large banks of deposit keeping the accounts of Government, the reserves of other banks, as well as extensive deposits and current accounts of the general public. They are in all respects similar to the Banks in England and Scotland and closely resemble the Bank of England. Each of these has 15 to 20 branches, established in some of the principal towns in the Presidency and their resources are employed in investments, advances and discounts, and regulate the rates for these in the market.

These banks have no power to issue bank notes, that being a strict monopoly of Government in India controlled by the Currency Department. The connection of the Government with these banks is that the latter act as bankers for Government and manage the public debt, the Government always keeping a minimum balance in these banks. According to the regulations under the Act, these banks are prevented from dealing in foreign exchanges and employing their capital for business outside India. The issue and circulations of bank post bills form a conspicuous part of their business. Their head offices and Boards of Directors are at the capital cities of the respective, Presidencies.

The Exchange Banks, with the exception of a few branches of the French and other continental banks, can be seen through-

out the East. In most cases, their head offices are in London, but the most important of these banks the National Banks of India, Limited, the Chartered Bank of India, Australia and China, and the Mercantile Bank of India, Limited, have their branches established all over the East, extending from Aden in the West to Yokohama in the extreme East. They attract large deposits, and supply that banking capital which India is so much in need of. These exchange banks have tended to increase Indian trade by negotiating bills drawn against shipments of merchandise from India. Documentary credits are largely allowed, and money is remitted by telegraphic transfers. They attract large deposits and at some of the important centres they succeed in obtaining large cash balances, which in turn are loaned out to traders and merchants for financing their exports and imports. They also do considerable business in discounting bills, loans on produce, stocks and shares, and especially in Government paper. There is yet another class of business which these banks are accustomed to do, *viz.*, *Exchange*. The word *Exchange* gives the banks the generic name with the public—it is their principal business—the very large item from which the profits of these banks at the close of a financial year are made up. By exchange we mean the operations in bills brought and sold—drawn on the different countries for the purpose of moving the productions of these countries to and from each other, and for conducting all monetary transactions between them.

A word of explanation may not be out of place as regards the sale of India Council Bills and in which these Exchange Banks regularly deal. The Government of India receives its revenues in rupees, but discharges its liabilities in England in Gold. The Indian produce, such as cotton, wheat, seeds, tea and jute is, bought in silver here and sold in Europe for gold. The India Council, in order to save the shipment of gold and silver backwards and forwards, sells every week in London bills or drafts upon India payable in silver; this sale is effected by public tender and the highest bidders get the drafts. Some-

times after the result is made known, a disappointed bidder whose tender was too low to receive any allotment, comes forward with a better offer, and a supplementary allotment is made to him. During times of brisk trade, these council bills fetch attractive prices, while the trade is dull they realise only low rates. Council bills or drafts are those drawn by the Secretary of State for India in Council, upon any of the Indian Treasuries in Calcutta, Bombay, or Madras, to meet the disbursements of money in London on account of India. These disbursements are not only the expenses of maintaining the Secretary of State's office, but also to meet the interest on the capital raised in Great Britain, for the construction of Railways, Public Works &c., in India.

I have explained the aim and scope of these exchange banks, but a detailed description of the mode of working exchange with the different countries would occupy more space than can be afforded in a paper of this kind. Operations of buying and selling bills on countries, with differing currencies require caution and best of judgments. Exchange may become favourable or go entirely against them, but a thorough knowledge of dealing in foreign exchanges would enable a bank manager to work them in a practical way in every branch of home and international trade and banking.

We are now left with the last division of our subject, *viz.*, Indian Joint Stock Banks. They have all been started with a rupee capital raised in India, say, within the last six or seven years and it is a sure indication of a desire for the expansion of banking institutions on western lines. With the growth of commerce and industry there has decidedly sprung up a demand for monetary accommodation, and this demand can be met only by the diffusion of Joint Stock Banking System. Without credit, which is the greatest factor in the manufacture of wealth, there can be no enterprise and expansion in the business world. There was a time when none but the wealthy enjoyed the facilities offered by a bank, but this should no longer be the case and it should be

extended to every class of people to promote national efficiency and productive enterprise. A large number of people are now availing themselves of the Savings Bank, but there is no doubt that those who are now saving a part of their income are not freely taking advantage of the benefits offered by keeping a bank account, and I venture to express the opinion that the hoarding habit of our people is more due to the fact that there are not Banks, branches or even Agencies situated within convenient reach of the would-be depositors. It may be roughly estimated that the total deposits in banks, excepting Government and Trust Fund deposits, exceed on the average a little over 6 as. per head of the population. India is, no doubt, a very poor country, and it is doubtful whether this represents the full measure of her financial capabilities. Whether it is so or not, we should like to arrive at a right estimate as to the financial capabilities of the country, not only for the successful enterprise of trade, industry and agriculture, but also for the true economy of Government administration. I may mention that this capacity can be developed only by the expansion of banking on joint stock lines. The country is progressing rapidly, railways and canals for the distribution of internal produce are increasing in number, post and telegraph offices have been planted throughout the country. More and more steamers with increased tonnage and speed are launched for service between the East and the West. Electricity has brought the ends of the world together, annihilating distance. Submarine cables are also laid and many other things calculated to extend the general prosperity of the country have been introduced. With the advent of these facilities there has been a marked expansion in the industrial and commercial world in India. Tea, jute, wheat, cotton, oil seeds and many other agricultural produce have increased in cultivation and in their output. Manufacturing industries have sprung up all over India and coal mining has advanced with rapid strides.

With this expansion in industry and commerce, the chief motive power, *viz.* the machinery for attracting and distribution of credit and money has not kept pace with the general prosperity of the country. Industrial development is more or less shaped

by the control of financial agencies which render them help. There is hardly any industrial concern which is not too often hampered by want of loanable capital. Hardly any busy season passes by without finding the Presidency towns deplete with money. In busy export seasons, discounting facilities are not easily obtained.

The Joint Stock System in banking alone can remedy the present unsatisfactory state of things and the expansion of this system will lead to greater enterprise in India. Private banks can do a great deal, but in these days when transactions in large amounts are growing more and more, there is a tendency for the private banker gradually to disappear. The partners in a private bank, being often well-to-do men may not care to increase their business, and with it, their responsibilities, but the directors of a Joint Stock Bank having to look to their dividends should use every endeavour to extend their business connections. The private bankers in Europe and America are rapidly disappearing and are being replaced by directors with a wide general knowledge of commercial affairs, and by managers, who possess a technical knowledge of Banking which, united with the requisite amount of tact and ability, enable them to make advances on securities which to an outsider may appear speculative, but which are in fact perfectly safe when all local conditions are taken into consideration. In recent development of banking two very marked tendencies of concentration by means of amalgamation, and the wide extension of branch banking have been the characteristic feature of the economic development in Great Britain. Towns in England which ten or twenty years ago had only two banks have now four, and these four now command proportionated more business than the two formerly did. New resources have been tapped ; " the habit of banking " has caught on among the people.

The original—I may say the primitive—idea of a bank does not extend beyond the four walls of his office, the place where the banker held his cash, kept his books, dealt with his customers, and, in fact, transacted the whole business ; perhaps

in a general way, also lived. In this way banking has been carried on for a very considerable period, but branches of banks and branch offices are scarcely more than a century old, and for long after that time they were hardly branch offices in the present sense of the term.

Concurrently with the desire to see more Joint Stock Banks established in India we wish to see more and more branch banks and agencies springing into existence all over the country.. Then only will it be possible for honest and hard working agriculturists, artisans and other classes to obtain loans on easy terms without having to resort to mortgage of their land, crops or other valuables. There is a great demand for money amongst these humbler classes, who form the real backbone of inland trade. In Great Britain, on the continent, and the United States, also in Japan, there exist a number of banks to help the artisans, the petty traders &c. In Japan there are about 45 agricultural and industrial banks. The industrial Bank of Japan has a capital of $2\frac{1}{2}$ crores, deposits to the extent of 10 crores, with a profit of 30 lakhs and dividing 7 per cent per annum for dividend. In France Credit Lyonnais, which has hundreds of branches all over the country, makes advances to the peasant and the small trader, enabling them to obtain money on moderate terms. The bank lend to the poor classes sums from £1 to £5 by discounting bills for these small sums. The Banque de France has a system, an entirely new system of credit, known as the '*warrant agricole*' to help cultivators and other lower classes to get loans on easier terms; they used to discount such small bills from the peasant population to such an extent that in one year the Banque discounted nearly 3,000,000 bills of less than £4 in value, more than half of which were of less than £2.

We have now the movement of credit unions started in India to help the poor peasants in times of need. The object with which these Co-operative Credit Societies are started is only to help the agricultural classes. Besides these, there are several other classes, the artisans, small trading and other professional men, who are always in need of monetary aid and our

Joint Stock System of Banking should find means to extend that aid to these classes.

If a bank is limited to one particular district, its profits and position will probably depend to a very large extent, on the particular industry of that district. If a bank has branches spread over a large area, it is probable that even if one portion of its business is for a time suffering from depression, yet another in a different district may be in a flourishing state. Another benefit from the distribution of branches over a wide area is the facility which is given for making exchanges, and for the flow of capital from one district to another. If there is an abundance of capital in one place, and a lack of it in another, the bank can utilise the deposits which it receives from the former and lend them to the latter.

The object of the Commercial Banks in India should, therefore, be to attract deposits, in fact, securing deposits on a large scale is the most important factor in Banking. Industrial activity and commercial enterprise now-a-days are carried on on such a gigantic scale that a private banker or any banker with small resources, has no chance to succeed. On account of this, not only have small institutions in England been absorbed by the bigger banks, but banks of the first importance have had to amalgamate together. The control of a large amount of deposits then is essential to successful banking on a large scale. The great historic houses of England and the United States, and on the continent—the Barings, the Morgans, the Rothschilds, and many other houses of their rivals and associates carry on chiefly deposit banking. They promote new enterprises making advances largely from their own resources in the early stages of such enterprises. When those concerns attain a stage of settled business and accruing profits, then they sell the going concern, or more often, the securities based on them, to the public. With the command or control of deposit fund, banking organised and developed the system of credit. Bank credit is, therefore, based upon the deposit system.

So far I have explained the utility of bank credit. What about the disadvantages in banking practice? First, we have to guard the overlapping of the Branch system in small towns. If unnecessary branches are established in small places, there will be considerable loss to the banks in managing and maintaining the bank should the profit accrued be not enough for the purpose. Moreover banks should be careful in making advances on the mortgage of properties not readily realisable such as in land, estates, and so on.

The desire to see Banking institutions multiply is a characteristic feature of the age. India has been greatly deficient in Banking capital, and the establishment of banks, from the facilities they afford for raising money, will induce men of capital to embark on commercial and industrial undertakings. British capital has hitherto been employed in India for industrial purposes to the mutual benefit of both countries, but Indian capitalists will do well to invest a portion of their spare funds in the promotion of banking institutions for the development of the natural resources of the country. My object is not so much to advocate the multiplication of banks as to impress on you the desirability of your opening banking accounts. Ricardo says: "A bank would never be established if it produced no other profits than those derived from the employment of its own capital: *the real advantage of a bank commences only when it begins to employ the capital of others.* By banking alone can the economic and commercial status of a country be elevated. By it alone a country can become industrially great, affluent and independent."

So much about the benefits and utility of banking. What about its management? It is indeed difficult for those who are unacquainted with the principles of Banking to understand its full import. There was a time, when the private banker's field of operation was greatly limited. He had not to trouble himself about the affairs of the outer world. So long as his few loans were safe, he led a happy life. But to-day, how different it is! The modern Bank manager should be an all round man. He is

responsible to his directors for the working of the vast machinery under his control, and is entitled to great confidence and co-operation from them. It is absolutely essential that he should possess business qualifications, tact and ability. The talents of the managers are very often a fair index of the talents of their Directors, though these names can be but abstract terms to customers living hundreds of miles away from their bank's head quarters. Hartley Withers, in his book, entitled, "The Meaning of Money" says, good banking is produced not by good laws, but by good bankers. The general managership of Joint Stock Bank to-day is a post of the highest importance. The manager's influence over the destiny of many trades is indeed great. Upon his action the economic welfare of the community in a measure depends. To him is entrusted the wealth of a number of people. In its safe keeping lie the seeds of economic good or evil. It is clear, then, that the manager of a bank should possess something more than ordinary business capacity; he should be a financier and statesman rolled into one. To go further into the details of the organization of a large bank would occupy more than the space required for a review of this kind. To the managers and their assistants is left the work of superintending the concern.

The present is, no doubt, the era of India's industrial and commercial development. Banking is the mainstay of industrial development and the more the number of banks in a country the more will be the country's commercial and industrial prosperity. The Commerce of India is expanding every year; she had boundless resources waiting to be developed. Hitherto the agricultural and manufacturing industries have been conducted with culpable waste and want of skill. The Indian rural labour is in an unskilled state, crude and inefficient. Considering India's ancient economic condition, she is now very much behind other civilized countries in enterprise and scientific knowledge. Capital, which is the moving power of commerce and industry, is stagnant. The outlets for safe investments with an adequate return are only few. Bagehot points out that the rapid increase of wealth in England is

partly due to the democratic nature of its capital. With the multiplication of openings for the investment of capital there is a constant increase in the surplus of production over the necessities of life, which gives the power to save. These opportunities have induced some people to save who would not otherwise have attempted to do so. The growth of capital is, therefore, governed by many causes ; not only the power and the will to save, but also by the institutions which influences people to accumulate. The economic effect of these institutions is considerable : it promotes habits of thrift, frugality, and forethought. They provide the means for gathering up even the smallest sums that would otherwise have been kept idle, or frittered away and wasted, and add to the productive capital of the country.

I have, to the best of my ability, shown you how by the extension of Banking Institutions, the resources of the country can be developed, command public confidence and are sure to attract the savings of the people. I venture to conclude by saying that the extension of banking on limited liability system is well worth the earnest consideration of all those who have given any thought to the economic development of India.

COTTON GROWING IN INDIA.

BY

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Unless the educated people take to agriculture themselves and set a practical example to the agriculturists, the condition of Indian agriculture will never improve. It is no good writing big articles and holding great meetings, unless those ideas and suggestions are tried somewhere and their practical results published for the guidance of the general public.

The next important crop to sugarcane is cotton and like it, is in a very bad condition. The produce is daily decreasing and the demand of Indian cotton is only found, because the other countries which produce better stuff cannot meet the demand of the merchant. Not only in foreign countries, but in India as well, fine thread cannot be spun of Indian cotton. I was asked by a friend of mine, who is a shareholder in a spinning firm in Delhi, the cause of this and whether the introduction of new varieties will remove this defect ; not only in Delhi, but I think all over India it is found that fine muslin cannot be produced from Indian cotton and so the cloth market remains as ever in the hands of foreign countries. It is a fact that the Indian cotton, as it is to be had in the market, is useful only for the production of coarse cloth. But if we study old history, we find that in olden times the muslin of Dacca was spun so fine that even Manchester to-day equipped with the results of the best scientific researches, is unable to produce such a fine stuff. These two facts taken side by side go to prove that formerly Indian cotton could produce a very fine cloth ; but at present either the method of spinning is wrong or the quality itself of the plant has since deteriorated. No doubt the machinery employed

makes the cotton incapable of producing a fine thread beyond certain counts but the whole defect is not due to this cause.

The first defect lies in the method of growing cotton, which I shall treat afterwards, but there is another draw-back, which I wish to bring to your notice and which has never been tried to be removed. Cotton is always picked up when the dew is still on the plants. I think it to be a very good principle as plants, if dry, are likely to be injured and the full blown pods leave off their cotton to be scattered around by the wind. After picking cotton is seldom dried by the agriculturists in these days. In olden times before the introduction of ginning machines the agriculturists ginned their own cotton and so they know the difficulty and had to dry it up as soon as possible. But now they try to make as much money out of it as possible and put it in a dark and moist room, where the sun never shines; thus they try to preserve the moisture. Or they sell the cotton as soon as it is picked up. In the latter case the dealer puts it in a cart and exposes it for the whole night to the weather; sometimes he tries to sprinkle water over it to increase its weight. This moist cotton is sent to the market and sold. The moisture is the worst enemy of cotton and shortens its staple. But as the price offered by the purchaser differs but little for moist and dried cottons this practice is tried everywhere. This cotton, when put in heaps for a few days in this condition, produces heat and turns the moisture into steam which spoils the quality of cotton still more. Sometimes the natural glow is wholly lost and the cotton is turned blackish in colour before it reaches the ginning factory. The worse is the case of the picked cotton put in dark and moist rooms. In ginning factories sometimes it has to be kept for a few days till its turn comes up and sometimes it is ginned the same day. The moisture is still there though it has evaporated to a certain extent and goes on deteriorating the natural quality of cotton. Generally all the factories which gin cotton do not spin them and so it has to be exported to other places where there are spinning factories. The managers of the ginning factories do not care to see whether the cotton they have exported will give goods and fine thread.

Now comes lastly the spinner who has to deal with such a spoiled cotton. In the days of hard labour every house of a peasant was a ginning factory though on a small scale and so the peasants had to dry their cotton as much as possible as the *charhhis* (ginning machines) employed could not properly work with damp cotton. I propose therefore, a few practical methods for the removal of this defect.

A committee should be formed composed of a few members from different countries. The members of that committee should see the managers of spinning mills personally to prevail upon them to fix the rates of ginned cotton according to the quality of fine thread it gives. The difference between the coarse and fine thread cotton should be a markable one so that the ginning factories may try to supply them only good cotton. The difference should be more than the cost of labour in drying the cotton and the loss in weight by evaporating the moisture, which is generally found in the cotton sold to them. It will give a healthy impetus to the ginners to supply good cotton only. These members should also see the managers of the ginning factories and ask them to pay better rates to the dried cotton than to the moistened one. They should calculate the loss in weight in drying it, and this loss and something more for the labour should be given to the sellers. They should also see that the cottons of different varieties and in different states should be kept and ginned separately. This will bring in a profit and reputation in the long run. If this be persisted in for a few years, I am sure that this complaint will cease.

I would now make a few practical suggestions regarding cotton growing.

Before giving in detail the methods of growing cotton, let me discuss the desirability of introducing Egyptian cottons or other foreign varieties in India. Cotton grown in India is considered very inferior and unless we change the existing kinds we shall not be able to do much in this line. But this idea is based only upon theory and very little upon practice. I do not say that the introduction of new kinds of seeds in India is

injurious or unnecessary, but I can emphatically say that there are no legitimate grounds for doing away totally with the Indian cottons.

The introduction of the tea plant in India was due to the successive trials made by the people in this direction and yet tea cannot be cultivated all over India. Similarly in the United Provinces experiments were made with different plants in Saharanpur and only some of them became successful while others failed. To think that Egyptian cotton must succeed in India, because it does in Egypt would be erroneous. The climate of Egypt is different from that of India and several other important factors prevent the cultivation of Egyptian cottons in India with success. My idea is that the question of introducing new plants should be wholly entrusted to the experimental farms of the Government and other private persons who should be very careful when reporting on the progress and difficulties. Generally the advocates of this idea become so much enthusiastic that the little experience that they get is made much of and largely exaggerated. For instance the method of making experiment is not minutely observed. The estimates of expenses are curtailed by very much and the prices which such a cotton mill will fetch are calculated by only sending a small sample to some foreign or Indian firm. To send a small sample which has been very carefully prepared and to calculate the prices thereon is highly misleading and in numerous cases has been the cause of serious results. The experiment should always be conducted under all possible unfavourable circumstances, so that the results of practical farming may be much more successful than the results of experiments. The area under cultivation for a new tried kind of seed should be sufficiently large and the manuring etc. should be done moderately as it is done by an ordinary Cultivator. If after such trials successively carried for at least two or three years it is found that the introduction of some of the seeds be beneficial it should be rigorously pushed forward and introduced into the area which is one and the same as regards the climatic circumstances. My idea is that the Indian

varieties of different agricultural produce is one of the best selection and can be much more improved by following the basic principles of agriculture as seed selection, manuring etc. It is no good to try new seeds through ordinary peasants who have no faith in them and are too poor to bear the loss caused by the introduction of a new variety.

As regards Meerut I have seen that the cotton produced is sufficiently of long staple and by following the suggestion given below the defect can be removed. I tried some years back two kinds of cotton, the seeds of which were obtained from Cawnpore Agricultural Farm and found that it does not give good average of produce and is not beneficial for our land. Those were samples of the best American cotton suggested by the Government Farm and no doubt the staple was longer and finer, the pods were larger and more in number but the time required for their growth was longer than required by the indigenous plants and so they had to be left in the fields for about a month more than the ordinary cotton. At this time, owing to winter the pods of these plants never bloom. Not only this but the quantity produced from a plant of these varieties considering the area required by a plant is much less than ordinary cotton. These defects obliged me to give up the idea of introducing the best variety experimented upon by no less authority than the Government itself.

Generally the varieties sown in these parts are three: (1) bearing a yellow flower, (2) a red flower, and (3) a white flower. There is very little difference in the structure of these plants and their leaves. It is very difficult to calculate the results obtained from different varieties. In order to calculate correctly I had to label the plants, according to the colour of their flowers in the beginning of the season when they put forth their flowers, as it is difficult to distinguish the plants when the flowers have turned into pods. I picked up cottons from these plants and kept them separate. I found that the cotton produced by white flowers variety is very brilliantly white and gives the longest staple; the yellow flower variety gives a small staple and

the cotton is not so white and the red flowered variety is between the two. The quantity, however, of ginned cotton and the cotton seed is a very important factor. The quantity of cotton ~~sown~~ sown from white flower variety is the least and the quantity obtained from red flowered cotton is the largest. Perhaps this is why all these kinds are mixed together. But now as the peasantry has only to sell their cotton to the ginning factories they can very well grow exclusively the white flowered cotton and I am sure this cotton if improved upon will produce a cotton equal in quality to the best Egyptian or American cotton. But the cultivators will be shy to cultivate it unless there be a sufficient margin of profit for them. The whole produce from a field of white flowered cotton is much less than the yellow flowered cotton. In order to combine all these qualities they are producing a mixture of different kinds of cotton.

The first and foremost important point to which I wish to direct attention of the cultivators is the seed they sow. Generally since the introduction of ginning factories, the seed employed is bought from those machines. The seed obtained from the factory is sometimes crushed up, sometimes the moisture in the cotton mars its germinating power and sometimes it becomes wholly diseased being put in a heap of cotton seed for a long time before sale. Not only these defects deteriorate the germinating power of the seed but the cultivator cannot be certain as to what kind of cotton he is sowing and whether the seed is obtained from healthy plants. Generally all the fields are attacked by an insect red in colour and on account of this insect the pods do not bloom or if they bloom at all, they are eaten up and give a very bad appearance to the cotton. The property of cotton is altogether destroyed and the innermost kernel of the seed is sometimes eaten up. As all the fields are sown over and over again by the same seed the disease becomes permanent. If from the second or third picking the healthy cotton be gathered from the full blown pods only and kept apart and the seed obtained from it sown, I am sure that the disease will be removed in no time. It should be explained to the cultivators that a bad seed produces a bad harvest and a good seed a good

harvest. This can very easily be done in the U. P. and other parts of the country where the system of establishing village banks is introduced by the government. These village banks advance money to the cultivators for the purchase of seed every year and so if instead of supplying them with money for the purchase of the cotton seed and other seeds, these banks open a seed store they can remove this defect and will do immense good to the country. The government or the people who are the directors of these village banks may take a note of this easy and practical suggestion and may introduce this system in some places only as a trial, though I do not think that there is any harm if it be introduced in all the banks at once.

By the seed selection, if rigorously practised, a good deal will be done in this line and after a few years we shall be able to say that Indian cotton is as good as any foreign cotton.

The cultivation of cotton is done either after the first rains or by irrigation about two months before the rainy season begins. The difficulty of irrigation is felt almost everywhere. Cotton therefore cannot be grown everywhere by irrigating the fields before the rains, except in parts where irrigation is effected by canals or wells.

The places where canal irrigation is possible cotton can be grown before rains. Experience has shown that generally the late crop of cotton is a failure in these parts as the cotton pods do not at all bloom out when severe cold begins. The ordinary cold season makes them red and does not allow them to open in full. Thus the produce becomes very scanty and the staple gets much shortened. The cultivators have only to collect all these pods from the plants and to cultivate some other crop in the field. These collected pods are placed in sunshine and thus the natural growth of cotton in them being stunted the cotton so obtained is quite useless. To prepare it for the market, it is mixed with good cotton and thus the good cotton is made worthless. The best season, therefore, for the growing of cotton is 2 or $1\frac{1}{2}$ months before the rainy season. Another advantage of early sowing is that the continuous rains for a few days which

generally destroy the cotton crop altogether can have very little effect upon the sufficiently advanced plants. The only defect noticed in the previous years is that the last rains are generally accompanied by the winds which spoil the whole fields by breaking their newly formed pods and scattering them on the ground. This defect can be easily remedied if proper attention be paid to cultivation. If the plants are not allowed to grow tall, there will be little or no fear of winds. The agriculturists generally sow very thickly and thus deprived of proper quantity of food and space they only grow tall. But if proper distance between the plants be maintained, the circumference of the plants will be large and wind will not be able to injure them. The cultivator should know that generally the plants which are very tall have very few pods but those which spread over a large area bear more pods. The cotton plants should not be allowed to grow straight. Their tops should be broken and allowed to sprout up at the joints. By this method the yield will be appreciably increased.

There are two methods generally followed in these parts for sowing cotton. One is by spreading broadcast the cotton seed and the other is by throwing the seed at a regular distance in the furrows either by a man with hand or by means of a bamboo attached to the ploughs. The second method is adopted only when deep sowing is necessary otherwise generally the sowing broadcast-system is adopted. The broadcast sowing can only be done by an experienced hand. If the sowing is performed by this system the plants grow very irregularly. The plants can be thinned by uprooting a few but the area cannot be filled in where there is no plant. Thus the system is very defective ; but if the seed be evenly and thickly sown the defect can be cured by a proper breeding of some of the plants. There is a very good system followed in some foreign countries. They mark out the whole field by means of ropes into equal squares the length of each side being equal to the distance they require between each plant. At the corner of each of these squares, the earth is dug deep mixed with manure and some 5 or 6 seeds of cotton are sown together. When they bear four or five leaves

one of the weak plants is uprooted when they grow a little higher another plant which is the weakest is uprooted and so on in the end there remains but one plant. These plants are covered to a small extent before the rains so that they may be able to get moisture but may not be attacked by rains. This system is very useful and can be followed in our country. The system requires a little more outlay but the advantages are numerous. If this system be followed several ploughings are unnecessary. The field will look very beautiful and the weeding etc. and other operations will be very easily performed. The cotton roots penetrate very deep into the soil and thus deep ploughing is necessary for a successful crop of cotton. Deep ploughing is impossible from our ordinary ploughs. But if the above system is followed it will be a substitute for deep ploughing and the defect in our ploughs can be successfully removed. The quantity of manure required in this case will be very small. There will be no more fear of rains. Thus all the difficulties met with in our system will be easily removed. I think that if the agriculturists try it once, they will stick to it. When the crop is sown after the rains, the system may not be successfully followed as there is no certainty whether the rain will not fall a few days longer. The plants if grown by this system will be much more easily attacked by rains if they have not grown to a sufficient height but for the fields which are sown before rains this system can safely be recommended.

Further, the cotton seeds should be well rubbed with cow-dung before sowing. This was done previously only with the cow's dung but now no consideration is paid whether the dung used is that of cow or buffalo. The agriculturists who first discovered this method had at least three clear advantages in view:—(1) the seeds were separated from each other and thus they could be very easily spread, (2) they germinated very rapidly, (3) the hereditary defects due to some fungi were removed.

The third is the most wonderful discovery and is better than other solutions suggested by the scientific world. The

effect of dung of a cow which has not given birth to any calf is the best and very highly recommended. This insight of our old agriculturist shows how cheap and yet effective their methods were; but now their descendants have forgotten them, and sometimes they know the method but not the theory involved in its use. I am a staunch advocate of the old system of agriculture and wish that the system may not be abandoned unless the experiment has shown its defects by successful trials. The question of distance between the several plants of cotton is very ably illustrated by a Hindi couplet which means,

“Sesame seed should be thinly sown and barley to be sown thick; the cotton should be sown at a distance of frog’s leap, and maize is to be sown so thinly that a man may easily pass through the field with a blanket on.”

The best manure for cotton is said to be the fresh dung put on every plant. In these parts, however, no manure is applied to this crop as the whole manure is employed in sugarcane field. But if cotton be sown according to the above process, very little manure will be necessary. In my article on sugarcane cultivation, I have given a few manures which can also be used with advantage in cotton growing. Potash, Magnesia, Lime and Phosphoric acid are required in abundance in the beginning of the crop and when the plant begins to bear fruits then phosphoric acid is required in a moderate quantity, lime and potash being required in less quantity. If 25 acres of land be sown with cotton seed and the produce be 10,000 pounds of cotton, then it will consume 12lbs. phosphoric acid, 12lbs. lime, magnesia 3lbs., sulphuric acid 2lbs. and potash 31lbs. So it is quite clear that only those manures will prove useful which contain these ingredients. The best manure which contain all these chemicals can be made in this way and be used for an ordinary land:—Daily refuse of cattle stable one part, wood ash $\frac{1}{4}$ th part, lime $\frac{1}{4}$ th part, and a little of Bone ash. All these should be put in a pit and left for a year. After the period of one year the manure will be ready for use. Bone ash is a very good manure for cotton crop as it contains phosphoric acid. It

once bone ash be used it will benefit the soil for 3 or 4 years. No manure containing nitrogen as ammonia in quantity should be used for cotton crop as by the use of these manures the cotton plant grows luxuriantly and attains good height but produces very few bolls and thus the yield is very little. Though fresh dung is used for cotton plants as said above it is not a very good manure. One important point in this connection should be noted that whenever a field is manured before sowing the manure used should be very finely mixed with the earth of the field; otherwise it will spoil the whole crop and the seed will not germinate. Its kernel is fermented if more than necessary heat is produced around it by the presence of manure which does not allow it to germinate.

Irrigation is another important point for this crop. The crop should be watered sparingly. It is necessary only when the plant bears flowers. The crop should be watered occasionally, when the nature of field requires it badly. If a cotton field be sparingly watered the yield will be greater. The continuous watering as is recommended for wheat and other crops proves injurious to cotton crop. Water injures this crop very much and so rain-water should never be allowed to stand in the field. The field looks diseased and pale and this disease is known as rust. Cotton should never be sown in the same field in which it was grown in the previous year nor in fields in which wheat or barley was sown in the last year as these crops also require the same chemicals for their growth. However it can be sown with advantage after cane or jowar crop as these crops do not take in these chemicals. In foreign countries several chemicals are used instead of cowdung for rubbing the seed, for steeping in the solutions of these chemicals destroy the inherent diseases of the seed and they germinate more easily. Only 3 Recipes are given below:—

(1) Take as much water as will be sufficient to steep all the seeds and mix well putrified cowdung and a small quantity of saltpetre. Put the cotton seeds in this solution and let them remain for 5 or 6 hours. Let them dry for an hour in the sun and then they may be sown.

(2) Take a gallon of water, put in a small quantity of salt-petre and unslaked lime. When both these chemicals are quite dissolved in water put in a small quantity of iron sulphate and steep the cotton seeds overnight. After taking them out in the morning, they should be dried in the shade. This solution should be prepared only in a wooden or an earthen vessel and all the seeds should be wholly soaked in water and should not be allowed to float over.

(3) Take either well prepared manure and dissolve it in water with a little salt and steep the seed in it for 5 or 6 hours or take ashes 2 parts and salt 1 part, dissolve in water and when dissolved steep the seeds for 5 or 6 hours and after taking them out, dry them.

These mixtures will help in eradicating the disease germs found generally in all the cotton fields in India.

In the end, I wish to say a few words on the mode of picking cotton. Generally in India cotton leaves, earth etc. are mixed with cotton while picking it. The cotton is only taken off the plant and the fruit itself, which has just been deprived of its cotton, is left on the plant. This not only gives a bad appearance to the field but proves injurious in dwarfing its further progress. These fruits should altogether be removed from the plant. In foreign countries these fruits are taken off the plants when the fruit has just opened and shown cotton in it. The cotton is taken out at home thus no leaves or earth comes with the cotton and also different kinds of cottons are easily separated. But this will not give a good yield as the cotton is not allowed to come out naturally. The picking should be more carefully practised and if necessary the pickers may be supplied with two receptacles for cotton and they should be instructed to put the

best into one of them. If after picking, cotton be put in a dry shady place to dry, it will keep its natural gloss and colour but if dried in the sun it will not remain as glossy as the sun deprives its gloss as well as its whiteness.

I am sure that if the above suggestions be carried into practice, we shall be able to show that India produces just as good cottons as she was producing only a few years back. May God bring in the day when we shall be able to see our country as materially and industrially advanced, as she was in olden times.

PROSPECTS FOR TECHNICALLY TRAINED INDIANS.

BY

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The report on "the enquiry to bring technical institutions into closer touch and more practical relations with the employers of labour in India." carried out at the instance of the Government of India by Lieut. Colonel E. H. de V. Atkinson, R. E. and Mr. Tom. S. Dawson, must have produced a depressing effect upon many Indian readers. The inquiry was, no doubt, restricted in its scope, being limited to an investigation as to how the existing technical schools and colleges might be adapted to the actual needs of the employers of labour. To be exact, the enquiry had reference to the following five questions :—(1) What openings exist for the employment of technically trained Indians and what further openings are likely to be available? (2) What type of man and standard of education and training do employers of labour demand in the various industries? (3) Have these demands been met by the existing technical institutions? (4) If not, how should these institutions be altered or added to in order that they should be in a position to meet these demands? (5) What arrangements can be made for systematic co-ordination between institutes and employers of labour, in order that they may work in with each other for their mutual benefit and for the good of the country? These objects of enquiry are, by no means, unimportant. If the needs of employers are not properly studied and technical education is carried on in a haphazard manner, waste of energy and time as also disappointment must inevitably follow. Before a further step in advance is taken, we must see whether the efforts made so far have succeeded and if not, we must inquire why they

have failed. If the existing state of things continues, we may have the double evil, employers clamouring for the right sort of men to work in their mills and factories and technically trained men in large numbers failing to find employment. Lieut. Colonel Atkinson and Mr. Dawson were not called upon to take up the larger questions of the organization of new industries or the revival of the old ones; or of the turning out of men of enterprise and business capacity, nor were they asked to frame any schemes of large and small technological institutes throughout the country where men may be prepared for the higher professional careers. Though the scope of their investigation was thus limited, the report they have compiled is very interesting and suggestive. The information they have collected from various employers of labour in the large industrial centres in the country and the opinions they have brought together of men intimately connected with industrial concerns and the technical institutions, throw a flood of light upon the general situation and are, therefore, extremely valuable. The present inquiry is connected with another which has been undertaken in England by a committee appointed by the Secretary of State to report upon the facilities that are available to Indian students for technical and industrial training in that country. Sir Theodore Morison took up the cause of these students who complained that they were denied reasonable facilities for practical training in English factories. Many Indian youths who are sent out to England by Government or private effort, find themselves handicapped by being shut out from factories. Under the circumstances, it becomes an important question to consider whether any improvement can be made in this state of things and if it is worth while maintaining the present system of giving scholarships and sending Indian students to England. Colonel Atkinson and Mr. Dawson have incidentally touched this question and offered suggestions thereon.

I have said above that the report under consideration must have proved disappointing reading to many. They would have liked to see a more comprehensive enquiry and to have recommendations with regard to the best system under which

Indians might be trained to start new industries and manage the large concerns like those that are to-day in the hands of their European brethren. In reply to the inquiries made of him, the Hon'ble Sir Gangadhar Row Chitnavis is reported to have observed :—" The points referred to me do not cover the whole ground of technical instruction, the true object of which, in my humble opinion, is and should be in the present state of the industrial and commercial development of the country, not so much the supply of existing demands, as to attract Indian talent to commerce and industry.....The production of skilled servants is after all, only a subordinate question." This typifies the expectations of a large number of educated Indians. It is admitted on all hands that our system of education has suffered much from its being too literary and has turned out thousands of young men who find the professions overcrowded and the doors of Government service closed upon them. Technical education is regarded as a panacea for the evil and Indian youths in large numbers are now going in for scientific and technical education. There is, however, no scope for them and unemployment stares them in the face, all the same. People who entertained high hopes of the practical usefulness and pecuniary value of technical education have been disappointed at the result. While employers of labour are everywhere anxious to get improved types of machines, foremen, maistries and other low paid servants, they have no faith in the highly trained men turned out by the colleges and institutes. They are simply "not wanted." It is really unfortunate that this should be so and that there should be no openings for the educated men who are expected to show enterprise in managing, controlling and starting industries. It behoves us to enquire what are the causes of this disappointing result and how our educated young men may be enabled to take their proper place in the industrial economy of their country. The questions that we have to consider are, are we going along the right lines in the matter of technical education? How will technically trained men get adequate scope for their natural and acquired talents? From this it does not follow that the

greater efficiency which practical training in the factory or the workshop imparts to the low paid skilled mechanic has no economic value and that all technical education worth the name should have for its object the turning out of the manager, the director and the supervisor in the mill or the factory. Both are equally useful and indispensable to the industrial progress of the country. Either class ought not to be produced at the expense of the other and there should be free scope and full opportunity for the aspiring captain of industry as for the not very ambitious mechanic.

Are we then putting the cart before the horse and turning out more technically trained men than are wanted or turning them out even when they are not wanted? We are told to believe that we are. It must be admitted that many of those who talk about technical education know very little about it. And in the peculiar state of India's economic development this is not unnatural. The report under consideration reminds us that the examples of England, America, Germany and Japan which are usually taken as guides in this country, supply no useful analogy as 'in them, the growth of manufactures, factories and workshops, preceded the establishment of technical schools and colleges'. We are told that technical education does not give birth to industries. It rather follows their inception. In a note submitted by the Hon'ble Mr. Chatterton to the Educational Conference held at Allahabad in 1911, he remarked: 'There is a demand all over India for technical education chiefly engendered by the hope that those who receive such an education, will be able to find employment in industrial work. But it is more than doubtful if meeting that demand will not intensify the evil from which India is beginning to suffer—the unemployment of the educated classes. Till Indian capital flows into industrial ventures and whilst European capital is only so employed, there is no hope that Indians, even if qualified, will find any large amount of remunerative work.' That the field of employment for technically trained Indians must be limited by the state of the indigenous industries is axiomatic. But it is not equally evident why

qualified Indians may not hope to get remunerative work while the industries are financed only by European capital. We are told every now and then that swadeshi industries are making a rapid progress and the increasing outturn of the mills, mines and factories is given as an indication of this gratifying fact. If the gold and coal mines, the tea gardens, the jute and cotton mills and other factories are so flourishing, and the industries are advancing by leaps and bounds, why should qualified Indians fail to find greater opportunities in them? It is not, I believe, suggested here that the doors of industrial concerns financed by Europeans will bear the legend 'No Indian need apply.' That, however, would seem to be the case in certain places. Yet we are assured that provided particular conditions are satisfactorily fulfilled, a man's race, creed or social position make no difference in the industrial world. The Madras Chamber of Commerce pointed out that in industry there was no racial question, as such whatever. If industrial managers could get any given work done as well by an Indian as by a European, the former if cheaper, as he always would be, would certainly get preferential employment. But commercial enterprises are not carried on a philanthropic basis and the employers would not care to make experiments. There is a very large body of opinion among managers which seems opposed to the employment of Indians to any high posts of trust and responsibility. Various objections are taken to the college trained Indian. We are told that a college trained Bengalee considers himself a gentleman whose hands should not be soiled by actual work and in the rough and tumble of mill life there is no room for such men. The Principal, Civil Engineering College, Sibpur, gave it as his experience with regard to his students that it is easier to place Europeans than Indians, there being no difficulty in obtaining suitable employment for Europeans. It appears from this that there must be some prejudice against Indian students as such. Many of the people interviewed by the officers deputed by Government to make the enquiry, stated definitely that they were not prepared to employ Indians in the higher posts. In their opinion, man for man a European was far superior to an Indian where work of trust and responsi-

bility was concerned. This might be set down to bias, but though there cannot but be an element of prepossession in the minds of European employers in favour of men of their own race, their view seems to receive some support if the evidence collected is more closely examined. When an Indian of the position of Sir R. Mookerjee declares that "he, from a commercial point of view, would much prefer an European to an Indian of similar qualifications when a man with a higher training was wanted", it is clear that the college trained Indians do possess certain defects which apparently unfit them for the higher positions.

One of the principal drawbacks from which Indians are said to suffer, is that they are really unfit for any hard work. They think all such actual work below their dignity and would not take off their coats and stoop to it when emergencies require it. They expect high salaries commensurate with the time and money they may have spent in schools and colleges and believe that it is their duty only to order and supervise. Employers do not naturally want such stiff-necked men and prefer low-paid and untrained but practically useful hands from their own factories. Indians, it is said, cannot manage the turbulent workmen in mills and factories and are often times very clanish. They do not like long hours, hard work and discipline characteristic of the mills and thus unfit themselves for employment which they sorely feel they are entitled to get by their education and training. There is therefore, no demand for Indians with very advanced training and most employers would much prefer a man of moderate attainments who could be moulded to suit their requirements. One can very well account for the comparative physical incapacity of the highly trained Indian for the work demanded of him by his employers. Education in India is at present, confined mostly to the higher classes, and graduates in Arts and Science usually come from those people. The lower classes have not the inclination and the opportunities to go in for higher and technical education and therefore a majority of the young men who are turned out by technical institutes are members of the higher class among

Hindus. There was long a complaint that education in India had become too literary, the liberal professions were over-crowded and the economic development of the country required that some of our young men should take to commerce and industries. But there is a hereditary and rooted aversion to manual work in the higher castes in India and they would not work with their hands like people of the lower grades in society. Technically trained men recruited from the higher classes see European and Eurasian gentlemen of their educational status and even a lower training earning high salaries and supervising big departments in mills and factories. It is their legitimate ambition to replace these men and they feel naturally aggrieved when similar treatment is not accorded to them. It is difficult to say if there will be any improvement in the prospects of men of advanced training if they are drawn from classes of society which are used to hard, physical work. They will be dissatisfied if they are not allowed to occupy the proper place to which they are entitled. But if all conditions about practical work etc. are fulfilled there is no reason why the employers who have a keen eye to business should not give them the due unless certain posts are to be reserved for non-Indians. "The prevailing opinion of employers of labour seems to be that the genius of the inhabitants of Bengal is not generally adapted for successful employment in the technical professions.....They make excellent workmen, but the educated classes, even after training in a technical institute, are averse to manual labour as a regular employment." The officers who made the recent inquiry into the question, did meet with some notable exceptions when the Bengalee has been freed from his social influences and has mixed with men of other races. As regards Bombay they are of opinion that of the varied races of the Presidency, the Brahmin seems least adapted for practical requirements. Though the inhabitants of Madras are good as workmen, the larger percentage of the higher classes, who are Brahmins, suffer, as a race, from the same disabilities. The Punjab and the United Provinces seem to be the best recruiting grounds for mechanics and engineers. By constitution, temperament, tradition and long habit, the Brahmins and other high class

Hindus are hardly equal to the physical labour and strain which employment in mills and factories entails. It behoves these classes, if they want to move with the times, to adapt themselves to the new conditions. They must learn to forget caste distinctions and be ready to do any kind of work they are called upon to perform. With the spread of education other classes will send their young men to technical institutions and the complaint of the employers will be removed. Caste restrictions are breaking down before the economic necessities of the day and young men of the higher classes among Hindus are taking to all sorts of professions which, some years ago, might have been regarded as degrading and dirty.

There is no reason to suppose that technically trained men will find no employment in the near future, if the training is given upon the right plan and with a practical object in view. In spite of the opinions expressed by a large number of employers that there are no openings for highly trained men, and though it is true that mere technical education will not give birth to new industries, must be remembered that industries in this country are steadily expanding. The growing use of machinery, electric installations, the erection of pumping stations, the rise of new industries, carrying out of sanitary works, the expansion of railways and so forth—all this is bound to create a considerable demand for technically trained men. Though the trained Indians turned out by the existing institutions are condemned by a large number of employers as being unsuited to their purposes and therefore thoroughly useless, many of them have commended for instance, the students passed by the Bombay Jubilee Technical Institute. These men are at present working quite satisfactorily and creditably in several places throughout the country where they occupy responsible positions. The complaint everywhere is that the products of the technical colleges are all right so far as mere theory goes ; but in practice they are no good. The suggestion that on completing their course at college they should spend at least two years in a mill or factory and there undergo practical training and acquire experience is eminently

valuable. It is gratifying to note that while a few employers do usually take a few apprentices and train them up, almost all with only rare exceptions, are most willing to admit apprentices provided they are willing to work on a living wage and conform to the discipline of the mill or factory. It is the duty of Indian mill-owners and others to render every assistance to their countrymen in obtaining the requisite training. The latter have a claim upon their support which ought to be cheerfully given even though it may cause some inconvenience. Factories and mills are no doubt, conducted upon business principles, but it would not be too much to expect even of the European employers of labour that they should make some concessions in favour of trained Indians and give them opportunities, which many have promised to do. As Indian citizens contributing to the wealth and progress of this country, they must take their part in promoting the industrial advance of India. It is unfortunate that youths who take to technical institutes are usually the sons of poor parents who must begin to make a living as early as possible. Those who can afford the money, have no inclination to follow the industrial line. They hate the physical labour and what must be to them, detestable work in the mills. This divorce of financial ability and opportunity from the keen desire to become managers of industrial concerns is a great handicap upon the present generation of technical students. European mill-owners find it more profitable to employ Europeans to the posts which require force of character, grit and resourcefulness and for which Indians are not trusted. As business-men they understand these things better than outsiders and their reasoning is intelligible. Almost the whole industrial field is, however, occupied by them and if they do not find Indians trustworthy there the matter ends. It is no use finding fault with their exclusiveness. Why should not Indians come forward, put their money into industrial ventures and give opportunities to their own countrymen? That is the question often asked and asked rightly. Speaking of the Madras Presidency, Sir Francis Spring, Chairman, Port Trust,

Madras, observes that there is not much hope there for the establishment of the industries requiring the employment of technically trained Indians of the better classes, until Indians have learnt to inspire commercial confidence in each other. As regards students from technical schools, they find it difficult to get admission into mills as the jobbers reign supreme in them. These men are generally jealous of and object to technically trained apprentices. The Parsees are said to have a good chance in mills owing to the fact that men of their own race own many mills. They have also a kind of grit and pushfulness lacking in members of other communities. The opinion expressed by the Secretary, Elgin Mills Company Limited, is worthy of serious consideration. He feels that the class of young men which the Thomson College is now recruiting, is totally unsuited to the needs of European mill-owners and managers. "These youngmen are usually members of families of the Indian gentry and as such are not altogether to be blamed for disliking the only class of work which employers would be prepared to offer them as a start. We can obtain the services of English managers, spinners, weavers, fitters, engineers, etc. members of the class which has produced workers in these trades for generations, and who not only have a certain amount of theoretical knowledge but what is far more important, *practical* knowledge, at their disposal". To replace the latter with Indians would be an expensive experiment in philanthropy directed to achieving in one generation what it has taken at least a hundred years to do in England. Students for technical institutes should be recruited, it is suggested, from the children of persons already employed as mill hands in a place like Cawnpore, where there is a class of hereditary mill-workers growing up now in the third and fourth generation. Schools should be started for the children of this class and the most promising among them should be selected for the college education which need not be very high and expensive. The managers and over-lookers in Lancashire are, in the majority of cases, not drawn from the ranks of the hereditary gentry and there is no reason to suppose that the gentry of this country

would take to manufacturing pursuits any more readily than those in England. Sir Thomas Holland says in connection with the requirements of the mining industry:—"Unless, therefore, Indians of the better class begin as English boys do as workers underground, they can never be mine managers". If the example of England is to count for anything in this country, it must be noted that "60 per cent. of the heads of private manufacturing businesses owed their position to their own private efforts and they had begun life in the lower economic ranks. In a cotton-spinning district it was found that 15 per cent. of the managing directors, 42 per cent. of the mill managers and 67 per cent. of the assistant managers came from the working class families, or families with incomes about the same as those earned by the operative classes." Pioneers of labour in England have, no doubt, mostly risen from the working classes and numerous cases can be pointed out even in this country of self-made men who have risen from humble positions and are now managers and directors of large commercial and industrial concerns. But industries now-a-days require scientific and technical knowledge and capital and these are not easily available to ordinary men. This is an argument in favour of a rapid spread of education in this country. Till we have satisfactory mass education in India, and opportunities are placed in the way of all to develop their natural faculties and hereditary skill and inclinations, our industrial progress will be materially hampered. Under existing conditions one would expect mill-owners and capitalists to train their sons and relatives for the industrial pursuits, but so far they do not appear to have done so to any marked extent. The owners of the Hathras Mills, themselves Indians, when interviewed, had to admit that it was no use giving technical education to men of high social position. They gave it as their opinion that the majority of mill-owners do not prefer to send their sons or relatives to technical colleges as they do not like to work with ordinary labourers and suggested that "boys of moderate positions, that is of middle class people, should be entered in the college, after they have taken reasonable education in the high school." Dr. H. N. Allen of the Engineering

College, Poona, in a paper submitted to the Lahore Industrial Conference, remarks that "the impression one gains in the technical colleges is that nearly all the students are the sons of people of very moderate means and that very few of them, if any, appear to belong to the families of the wealthy manufacturers, whose sons should be training themselves to be officers in the industrial army. How are our Indian capitalists educating their boys? Wealth is a stewardship, and the accumulation of great fortunes individual hands can only be excused on the ground of important services rendered to the country by those holding them."

Though many employers are not satisfied with the type of the trained men turned out by our technical institutes, there is no ground for disappointment. Some of the employers have found these men quite qualified and they are to-day occupying responsible posts. Technical education in several parts of the country is yet in the experimental stage and cases of failure are bound to occur. But from the accounts one gets from Bengal and elsewhere of the successes achieved by students who have undergone any of the courses of technical training are full of hope. That is also the impression formed by the two officers deputed by Government to make a special inquiry into the subject. These are their words :—"We do not feel in the least discouraged by the results of our enquiries. We recognize the formidable difficulties that technical education has had, and will have to encounter, but given time and *practical* guidance we are sure the average of success among technically trained Indians will be as great, if not greater, than among those turned out in England, and this opinion is confirmed by the number of successful instances we have met with." The economic and social forces that are now at work in India are loosening the rigid fetters of caste and the disinclination for hard physical labour which characterises certain sections of society is being fast overcome. Our technical institutes will therefore, get better material and their product is bound to turn out more satisfactory. Even then a average young man, fresh from his school or college, cannot expect straightway to obtain a comfortable

job and a fat salary. It is not possible for him to do justice to the work assigned him till he gets some experience. No employer would care to pay a man to help him to learn unless he be an apprentice. The suggestion has, therefore, been made that no student should be regarded as having completed his training and should receive a certificate unless he has put in two years in a mill or factory and actually worked there to obtain practical experience. A majority of the employers of labour interviewed expressed their willingness to take on students from technical institutions as apprentices and this system is being regularly followed even now by several of them. Their complaint, however, is that the apprentices do not keep regular hours and conform to the discipline of the factories. Those who wish to learn, however high their theoretical knowledge may be, must be willing to work with and like the regular employers and be content with a living wage. On this condition they will be admitted most cheerfully by the employers. If this kind of practical training is made an indispensable requirement before a pass certificate is granted in all technical institutes, more satisfactory results will follow. It is said that in England too much is made of the practical man who rises from the ranks by sheer dint of ability and after a lapse of years to the higher rungs of the ladder and that the result of this predilection has been that employers have not taken proper advantage of the technically trained man as in other countries. We are told that there would be a gain in efficiency if the latter were more fully utilised and the tendency to underrate his utility were corrected.

Another matter which has recently attracted public attention is the wisdom of awarding state technical scholarships to young Indians to enable them to proceed to England or some other country for study. It has been found that these men, on their return to India, get no suitable employment and are scarcely fit for any practical work. The latter difficulty can be got over if only such students are sent abroad as have already obtained all the technical education that is available in this country and if after the completion of their course in England

or America, they are made to attach themselves to a factory and get practical experience. In the opinion of some the money spent in foreign technical scholarships will be better utilised in this country if provision is made in an Indian technological institute to impart the higher training. Scholars sent abroad by Government, Native States, Associations or philanthropic and public spirited individuals find themselves, on their return, stranded without any prospects of employment. The money and the time and the energy are often wasted in this manner and the disappointed young men get what service is available to them. A few have succeeded, with the assistance of capitalists, in starting new industries which are in a satisfactory state. Several have failed owing to lack of practical knowledge and experience and their concerns have come to grief. Consequently these men cannot inspire confidence in their countrymen and they are looked at askance by the public. Recently governments have been very properly making it clear that students receiving state technical scholarships should not expect to obtain employment from them on return and usually preference seems to be given to those that have already had some training in this country and have prospects of future employment. That a central fully equipped technological institute on the model of English or German institutions is urgently wanted for India, if not one for each of the larger provinces, also goes without saying. Technical Colleges of a moderate character and scope are also necessary for each province. When provision is thus made for satisfactory training in this country, it will no longer be necessary, to the extent as at present, to send students abroad with technical scholarships. The Cawnpore scheme appears yet to hang fire and it will take years before we approach the ideal. In the meanwhile it is satisfactory to see technical institutions rising up in every part of the country to satisfy the growing demand. But whatever endeavours are made, they ought to be systematic so that there may be no waste or repetition of mistakes. The recommendations of Lieut. Colonel Atkinson and Mr. Dawson in this connection are very valuable and ought to be adopted by

Government when they formulate any schemes for the extension and improvement of the existing facilities for technical education in this country.

While there are few openings at present for the highly trained Indians, the supply of expert mechanics appears to be far short of the demand. I happened, the other day, to read in a newspaper two advertisements, one below the other, the first calling for a skilled mechanic on a tempting salary and the second inviting applications for the post of an arts-graduate who was offered something like half the pay of the mechanic. This is an instructive commentary on the present situation so far as skilled labour is concerned. Expert opinion is divided as to the best method of training workmen and foremen for the large industries employing machinery ; some employers are of opinion that the proper training school for these is the factory. They take up the sons of their own workmen and find in them excellent material. Great difficulty is, however, felt in giving training in this manner and night schools have been condemned as unsuited to this country. Evening or afternoon classes will not turn the type of workman needed and some grounding in theory appears to be essential. Sir John Hewett, late Lieutenant Governor of the United Provinces, held the view that "the training of foremen for the large industries employing machinery should begin by the study of theory, and should be completed by practical work in the factory or mill rather than follow the opposite course."

It is not, however, the purpose of this paper to enter into a discussion of the systems of technical education or the general education which should precede a technical course in schools. Suffice it to say that there are large openings for skilled workmen everywhere provided they give satisfaction to their employers who are often unwilling to admit outsiders. Government ought, therefore, to formulate and adopt some practical scheme for training this class of men in co-operation with employers of labour. The sons of artisans in India instinctively catch the profession of their parents and if they are recruited

for technical schools, the gain in efficiency will be enormous. The Indian railways are big employers of labour of every species and grade of technical skill but the system which they are seen to follow at the present moment is the most unsatisfactory imaginable. There is infinite scope for the employment of Indians on the railways in every capacity as engineers, permanent way inspectors, signal inspectors, erectors and so forth. Government, who now own many of the important railways, ought to see that the methods of recruitment and training followed by them are right and that the companies afford reasonable or even liberal facilities for trained Indians on their railways.

I prefaced this paper with the remark that the report under consideration must have caused disappointment to many Indian readers. They cannot bring themselves to believe that highly trained Indians should have no scope while we talk with pride of indigenous railways and tramways, mills and factories, mines and plantations. Are Indians, who have qualified themselves by their education, to be relegated to the position of low paid subordinates in these concerns and to join the large army of the educated unemployed? This is the question they will ask themselves and they will find an answer thereto in the report itself. Even granting that the European and Indian employers often times display a spirit of exclusiveness, there can be no doubt that the so-called technical and industrial education imparted in many places in India has been along wrong lines. We move very slowly in this country and the examples of Germany and Japan are not in point. Technical education with us is yet in the stage of experiment, which will take time to bear fruit. Efficient labour is only one factor in wealth production and the absence of enterprise, mutual confidence and capital are powerful drags upon its wheels. Under these circumstances it is futile to expect better and more rapid results and one's hopes ought not to be unreasonably too high. In the opinion of some, in the industrial advancement of India, we must begin at the top. Without minimising the importance of creating a class of trained and educated operatives, it has

been stated that "the most important factors in the increased production of national wealth would, in the case of Indian at least, at present, be the leaders, managers, directors and supervisors of industries. It is the skill, capacity and training of generals and captains which determine victories more than the bravery and steadiness of the rank and file of an army." (The Hon'ble Mr. Mudholkar.) The chief difficulties in the way of the realization of this wish have been referred to above. They are connected with the social and economic condition of the people of India which cannot be changed in a day. If supreme efforts are, however, made by Government and people, ultimate success is assured. By over-hauling the system of general and technical education and granting all possible facilities to Indians for training and employment, Government can materially improve the industrial prospect. The sacrifice needed for this will be worth making. Then the drawbacks in the physical, mental and intellectual constitution of the average Indian candidate for employment, described by the employers of labour are not imaginary and they must be removed if Indians are to inspire more confidence. The hopeful feature of the situation is the willingness of the employers, European and Indian, to take up apprentices from technical institutions and give them opportunities for gaining practical experience. The outlook, on the whole, is eminently encouraging and one need not feel disappointed or show impatience if the results are not as bright as one anticipated.

Co-operative Societies : Their Object and Utility.

[BY MOHI-UDDIN AHMED ESQ. PERSONAL ASSISTANT TO THE
REGISTRAR CO-OPERATIVE CREDIT SOCIETIES, BEHAR.]

INDIA is a country of small cultivators, traders, artizans and these people who form the bulk of population are generally very poor and are in a state of chronic indebtedness. It is well known that even a single year's failure of crop drives millions of people to the verge of starvation, and as the monsoon in this country cannot be depended upon, nor can one have any possible control over it, it is clear that famine and the havoc it causes will continue unless some effective means is discovered to minimise the effect of these periodical visitations. As it is not possible to control the clouds, something must be done to improve the material condition of the people which will enable them to combat the effects of famine and drought. In a country where the bulk of the population is in a state of chronic indebtedness, we cannot hope to improve their material condition, unless a satisfactory remedy is found out for the cure of this great evil. To attain this end Government has been devising many means but none has been discovered so effective as a Co-operative Society. This panacea for curing misery and poverty was first discovered in Germany and after 60 years of trial its efficiency has been demonstrated. Why is it that the people of this country are so poor? One of the chief reasons seems to be that there is no co-operation amongst them, every one tries for himself, nay, he tries to improve his condition by ruining that of his neighbours. For want of this combination people easily fall victims to stronger men's greed. It is an admitted fact that small cultivators, traders and artizans must borrow. The very nature of their occupation and also their social customs make borrowing a necessity. In borrowing they are compelled to pay a very high rate of interest as their individual security is not good. It is also well known that when a man in difficulty goes to his mahajan the mahajan naturally tries to make the best of the opportunity and it

After having received the certificate of registration the society should hold a meeting to elect Punchas (or Committee of Management) for the conduct of its business, as well as supervisors whose duties are laid down in the bye-laws. The society should also collect the entrance fees from members at the rate fixed in their bye-laws. It is desirable that the rate should not be less than one rupee.

The fund derived from entrance fees will form the nucleus of the Society's Reserve Funds. The society should then proceed to make an estimate of capital required to meet the demands of its members. In framing the estimate it is necessary to exercise the greatest caution. Before a society has learned its work it should not be allowed to borrow a large sum and at the same time the amount borrowed should be sufficient to dispense with the necessity of any further help from the mahajans by the members. Let us suppose that the society after making its estimate is successful in raising the money from some capitalist who has not only love for his country but has also an eye towards business. As the investment will be quite safe owing to the unlimited liability of the members coupled with the fact that the Government Auditor audits their accounts and the Registrar looks after and inspects the societies—he would naturally charge a lower rate of interest than he would do if he lent the money to any individual cultivator. The best method, however, of raising the required capital is to collect deposits. In a village every man is not necessarily poor. There might be men who can make deposits in the rural society which will not only give them a fair return for their money, but which will also be a great help to their poorer co-villagers. The Punchas will jointly execute a bond in favour of the financier, which will be binding on all the members. If the money has been raised by deposit, each depositor will be furnished with a pass book just as is done by the Post Office. These pass books can be obtained from the office of the Registrar. After raising the money the punchayats, who carry out the work of the society in its behalf, lend out the money amongst the members, according to their requirements and their ability to repay. After the registration of society the punchayats can admit new members according to the rules

of the society. In selecting a member the first thing to be seen is his character. If a man is poor he can be admitted as a member, but if, on the other hand, a man is fairly well off but not quite honest in his dealings then such a man ought not to be admitted as one black sheep may spoil the flock and bring discredit on the association. Loans should be given on personal security. Each borrower should be required to furnish two or more sureties as demanded by the Puchas in proportion to the amount of loan granted. Mortgages may in exceptional circumstances be accepted as collateral security. It is a recognised principle that a co-operative bank should always give preference to personal security and there are several good reasons for this procedure. In the first place, personal security is quite a good kind of security but the most important reason is that sureties prevent the borrower from getting more money than his actual requirements thus providing an effective check against improvident borrowing. It is the duty of the Puchas to see that money is generally lent for a necessary purpose and that it is spent on the purpose for which it is borrowed. It is to the interest of the sureties to see that the borrower does not waste the money and that he repays it on the date fixed. Lastly it teaches mutual help and increases brotherly feeling in the village community; for the man who stands surety certainly learns the habit of self-sacrifice and mutual help. The purpose of loan should always be ascertained and this should be taken into account in fixing kists for repayment. If money is required for seed it must be repaid after the crop, for which seed was purchased, is harvested. The condition of the borrower should always be taken into consideration. For instance, if a man has borrowed for buying a bullock and if the Puchas find that he cannot pay the amount in one year, it can be made repayable in more than one year. If money is lent to a shopkeeper then it is better to realise a small portion of capital and interest monthly so that the borrower may pay his debt out of his monthly profit. As the Puchas know well the condition of every member and if they exercise a little intelligence in fixing kists for repayment according to the borrower's circumstances there ought to be no default. When the Puchas in this respect fail to do their duty properly then the members become irregular in their payment which should never be permitted in a

co-operative society. Let us suppose that a society has raised its money at $12\frac{1}{2}$ per cent, and their rate on loans should not be less than $15\frac{5}{8}$ or $18\frac{3}{4}$. This should be higher than the rate at which the society raises its capital in order that there may be a margin to meet accidental loss and to build up a Reserve Fund. It should be borne in mind that the sooner this fund is built up the better it is for the society, for when it builds up a substantial fund out of its own profit for which no interest will be paid to any one, the association will be able to lower the interest on loans and will at the same time increase the stability of the society and will always be a source of strength to the Bank. When a Bank has got a large reserve it can borrow at a lower rate of interest as people look upon the reserve fund as security for their money. For the first few years—say, for 3 or 4 years—it is advisable to use the reserve fund as working capital to enable the association to build up its capital quickly but after that it must be scrupulously kept apart in the Savings Bank, so that it may be drawn upon in times of need say, when there is drought or famine when members will not be able to pay but will require help to tide over the bad year. The rate of interest on deposits should also be fixed by the society and this rate ought to be slightly lower than the rate paid for borrowed capital. For instance, if the rate of borrowing be 12% the rate of deposits should be $9\frac{3}{8}$. The reason for this is that the society in that case will try to raise their fund by means of local deposits to make larger profit and at the same time such endeavour on the part of the society will teach the members the habit of making savings deposit. It should also be borne in mind that deposits in the rural bank are meant to be savings deposit and not an investment for profit. A society should make every possible effort to collect the surplus earnings of members in order to teach them thrift. A member who deposits his savings in his society, at the time of his need (for instance at the time of marriage, *sradh* or sudden mortality of cattle) will have no necessity to borrow as he will be able to meet the expenditure by withdrawing his deposit. Let us now see how the Puncbas who are entrusted with the management of the association should carry on their work. Their duties have been laid down in the bye-laws which should be carefully read by Puncbas and explained to the

members. It is very necessary that they should at least meet once a month, say either on the full moon or on new moon day to transact the business of the society. The necessity for fixing a day beforehand is that it may be known to all the members so that they may all come and attend the meeting either to borrow or to pay their kists or to make any other representation to the Punchas. The supervisor should also attend the meeting. Their duties have also been specified in the bye-laws. The most important duty is to see that the money borrowed is spent for the purpose for which it was taken. They should also report on the general conduct of the members particularly those matters which might affect the interest of the society and they have also power to enquire into the conduct of the Punchas. In the monthly meetings of Punchas new members may be admitted after due enquiry into their character. Loans should be granted and instalments should be realised and the supervisors should also report whether the loans have been used for the purposes for which they have been taken. Whatever is done in the meeting should be recorded in a minute book. At every meeting the cash in the hands of the Treasurer should be verified. It is desirable that one member of the punchayat should keep the accounts, and another keep the cash. The society should appoint a separate man as Treasurer. This arrangement will prevent falsification of accounts and will thus safeguard the danger of embezzlement and misappropriation of money. It is desirable also to place a certain proportion of the annual profit in the Reserve Fund which should be kept separate, say, in a Post Office Savings Bank. The reason is that a reserve fund is always necessary for the security of the money of the investors. This fund is the property of the society and is indivisible. If a society is closed the fund may be utilised in any work of public utility. Members will not get any chance to make up a society for the sake of dividing the fund amongst themselves, nor be tempted to break up a successful society and divide the spoil. The office bearers of a society should not get any remuneration. If they are paid anything, they will always try to get themselves elected as punchayats, and in order to ensure their election they might try to make themselves popular and show special favour to members in the matter of granting and realising loans or in other matters which might be detrimental to

the interest of the society. Besides, any increase in the cost of management will decrease the annual profit and thus cause delay in building up the capital of the society which is essential to lower the interest payable by the members. The work required to be done by the Committee is of a very light character, while the benefit derived from a society by the village community is very great and there is no reason why they should not work without remuneration.

It may be pointed out there is a good deal of difference between borrowing from a mahajan and from a Co-operative Bank, even supposing that the rate charged by the mahajan is the same as is charged by the rural society.

What is the difference between borrowing from a Society and from a Mahajan?

In a society the whole of the interest which the members pay does not go to benefit any particular individual but a portion accumulates as a joint fund and increase the capital of the society, and thereby enables the society to lower the interest later on on loans given to the members. It will thus be seen that the whole interest is not lost to the borrowers but accumulates for his future benefit and for the benefit of the whole village community. The interest of a mahajan and his client are antagonistic and the mahajan would naturally try to make as much high profit as he can, but the rural society is a friend of its members and does everything for the benefit of its members. It realises its debts by fixing convenient instalments charges no compound interest and every day watches the welfare of the members by controlling the money lent out, so that no member may spend money in any way which is not beneficial for him. The society exercise a friendly pressure in strictly realising the kists on the due dates only to teach the members thrift, foresight, and business habits, while the mahajan gives his client rope enough to hang himself so that he may profit by his ruin. He therefore does not care to what use the borrower puts his loan, nor does he take money by small instalments, nor does he press the borrower to pay up until he finds that by the gradual addition of compounding the interest the amount has just become high enough for the borrower to pay without parting with his valuable land. The ordinary people have very little notion of punctuality and by nature are unpunctual. The mahajans connive

at this habit, nay, encourage it in order to take advantage of it and to ruin the debtor by taking possession of his land. A society always strives to root out this bad habit by strictly enforcing payment on the due date.

I shall now sum up the moral and economical benefits which a co-operative society confers on the people.

Moral and economical benefits of a Co-operative Society.

1. It will enable the members to get money at a cheap rate of interest which in itself is a great boon to the people of this country.

2. Unlimited liability will unite the people into one band of brotherhood for the natural law of self-preservation will make one member the well-wisher of another member lest the insolvency of one member should affect all the members.

3. It will keep down all racial jealousy and bitterness because the society make no difference between Hindus and Mohammedans or between a Brahmin and Sudra.

4. It is expected that it will form the nucleus of the village punchayati system for the simple reason that it would be to the interest of the members not to fight amongst each other for money spent it in litigation will cripple the resources of the members and interfere with the satisfactory progress of the Bank. No man will dare to give false evidence against his neighbours lest for such conduct he may be turned out of membership. If the punchayats use their influence for the benefits of the members, frivolous litigation, which is ruining the country, will soon be a thing of the past.

5. These little associations will collect all the idle money lying uselessly buried in the people's houses and these will be distributed amongst those who are in need of cash to be used for productive purpose. One cannot imagine how many thousands and crores of money could be thus collected and utilised for increasing the wealth of the nation. It often happens that Hindu widows have got little *stridhan*, but they never get anything out of it. Either her stronger male relatives take it always from, or, if she lends it

out or invests it in any way, her dishonest agent may appropriate a good portion of it. These poor widows by investing in their village society will be able to get a fixed income which will make their hard lot less burdensome. It will teach the common people the essential virtue of thrift and thus increase their comfort and happiness.

6. The society will put a stop to extravagant marriage and *sradh* expenses which have been the cause of the ruin of many people, because the punchayats will not advance money in excess of what is strictly necessary to perform the ceremonies.

7. These societies will teach business habits, foresight, thrift, self-help, co-operation :--virtues which are essentially necessary for the economic progress of a nation.

8. A society can with the permission of the Registrar spend a portion of its profit on any charitable purpose or work of utility in the village. Thus the society can pay for a teacher for the education of their children and can introduce free primary education in their village, or they can improve their water-supply and make other sanitary improvements, and altogether, prevent cholera and other epidemics which every year cause such a large mortality.

9. If eventually there be a large number of societies round a certain centre, the societies can combine and contribute annually for the up-keep of a hospital in which District Boards are sure to give substantial help and thus the members will have medical help and assistance near their villages.

It will be seen from the above that the potentiality of these societies for the benefit of humanity is immense. The resource for uplifting the people are almost unlimited, provided they are conducted on right principles and from disinterested and unselfish motives. People who do not know much about the co-operative societies labour under the belief that it is a Government institution for providing money at a cheap rate of interest. It is necessary to disabuse them of such ideas. It is purely a people's institution where people combine to work out their own salvation in the way I have indicated above. Government is only trying to teach people to work out their own economic salvation by their own

self-help. As for supplying money at a cheap rate of interest such is not the principal object of a co-operative society. I cannot do better than quote Sir Frederick Nicholson, a great authority on this subject. He says: "The societies are not meant for the outpouring of cheap capital to a class of people unprepared for the boon, but it is meant for the promotion of facilities for saving, encouragement of savings deposit, inoculation of the true objects, uses and limits of credit, in other words the development of the essential national virtues on thrift, foresight and self-help. The institution being based on the principles of co-operation bring the isolated units of society into association and by association teach the benefit and virtue of mutual assistance in thrift and in credit, in combating improvidence within and usury without, in developing industry and in assuring men the results of their industry, in stimulating men to new ideas of life whether economic, social, or moral." Much has been done by the Government and the Government is prepared to do more, but the movement cannot be a real success unless it is taken up by the people, and men of education and influence begin to take active interest in it.

In many places central banks have been opened with the

What steps have been taken to propagate the movement? following objects:—

(1) To develop co-operative societies within its area.

(2) To carry on banking business with such societies.

(3) To control its affiliated societies by careful and regular inspection and to further the interests of the societies in every way. These banks must be fed by deposits and it is hoped that those people who have any concern for the good of their country will freely come forward to make deposits in these Central Banks where the investment is perfectly safe and far more profitable than an investment in Government security or even in landed property. The accounts of these Banks are audited by the Government Auditor and as the Banks do not speculate but lend only to co-operative societies on the joint liability of the

members there is absolutely no chance of loss in these banks.

* The Registrar will always be glad to give advice to those who have the true welfare of their country at heart in opening societies in such localities where such gentlemen can devote a portion of their time in looking after the societies, particularly in their infancy.

It is time now for the well-wishers of their country to show by deeds and not by mere words that they are really in earnest to assist the mass of this country to work out their moral and economic regeneration *. To those who want to study the subject more fully, the following books

are recommended :—

- (1) Report regarding the possibility of introducing Land and Agricultural Banks into the Madras Presidency. Price Rs. 2-8, Superintendent, Government Press, by Sir F. A. Nicholson, I. C. S., Madras.
 - (2) Rural development in Burma by H. Clayton, I. C. S. Price Re. 1, British Burma Press, Rangoon.
 - (3) " People's Bank " by H. W. Wolff. From Messrs. Thacker, Spink & Co.
 - (4) " People's Banks " for Northern India by H. Dupernex, I. C. S. Price Rs. 4. From Messrs. Thacker, Spink & Co.
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REPORT

ON THE WORK OF THE

INDIAN INDUSTRIAL CONFERENCE

INCLUDING

A RECORD OF THE GENERAL INDUSTRIAL ACTIVITY
IN THE TWELVE MONTHS.

December 1911 to November 1912.

POONA :

PRINTED AT THE ARYA BHUSHAN PRESS.

1913.

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REPORT

ON

INDIAN INDUSTRIAL CONFERENCE WORK

AND RECORD OF

**General industrial activity in the country in the
twelve months ending with November 1912.**

PART I.

INDUSTRIAL CONFERENCE WORK.

December 1911.

The report submitted to the Seventh Indian Industrial Conference which met at Calcutta in December 1911, dealt with the period of twelve months from December 1910 to November 1911. The work that engaged the Conference Office during the months of November and December 1911, was mainly in connection with the arrangements for the last Session of the Conference, in communication with the office bearers of the Local Reception Committee at Calcutta.

The Conference was held under the Presidentship of the Honourable Mr. M.B. Dadabhoy, C. I. E., Bar-at-Law, Nagpur, on Friday the 29th December 1911, in the spacious pandal erected for the Indian National Congress. Full account of the proceedings of the Conference, including the Resolutions passed at its Session, the papers laid on the table, the speech of the late lamented Maharaja of Mayurbhanj in his capacity as the Chairman of the Local Reception Committee, the Presidential Address and speeches delivered during the discussion of the Resolutions &c., will be found in the consolidated Report.

The grateful acknowledgments of the Conference are due to the learned writers of the papers on a variety of subjects of great practical importance and utility. Among the contributors are to be found high Government Officials and also non-official gentlemen of note hailing from different Provinces, whose views on the topics dealt with by them, deserve attention at the hands of persons, who are interested in the economic development of India and the prosperity of its existing industries.

January to November 1912.

Resolution No. XIII passed at the Conference, appointed the Honourable Rao Bahadur R. N. Mudholkar as the General Secretary, Mr. N. A. Dravid, Honourary Assistant Secretary and Mr. M. B. Sant as Permanent Assistant Secretary of the Conference and authorised the General Secretary to appeal to the public for raising a sum of Rs. 5,000 to meet the expenses for the maintenance of the office during the next twelve months. To give effect to the financial part of the above Resolution, about 200 appeals for funds were issued to leading Zamindars, prominent industrialists and noted gentlemen of all the Provinces. But it is our painful duty to have to state that the response this year was as discouraging as that of last year. Out of Rs. 5,000 which is the estimated amount of expenses per year for the efficient working of the office, the sum of Rs. 2,455 only has been recovered so far. Several gentlemen, whose names it is unnecessary to mention, who offered to subscribe to the funds of the Conference, have not sent in their promised quota, several others, who are considered leaders in their respective provinces have given no response to the appeal made to them. We can only hope that it may be our good fortune to be able to present a more hopeful view of our finances, this time next year.

The failure of the Reception Committee of the Industrial Conference at Calcutta to collect the necessary funds to meet the expenses which legitimately fell upon them, further added to the difficulties of the Conference Office, which had to pay on

of the general funds the cost of printing about 1000 copies of the Annual Report. The amount of subscription actually collected was found hardly sufficient to defray the expenses of the office and the Calcutta Conference. No margin was left for further expansion of the work of the Conference, for which there is unlimited scope. Provincial and District Committees have to be re-organised, new committees have to be opened in important places, and above all, effect has to be given to Resolution No. IV of the last Conference, which authorized the deputation of one or two persons to institute enquiries into the causes of the failure of at least a few of the important enterprises started in the country for carrying on new industries. Want of adequate funds to defray the travelling expenses of the office staff, has prevented the General Secretary from carrying out any of the objects mentioned above.

During the year under review several queries were addressed by private individuals on industrial and educational matters and the Conference office, in each case, tried to answer them to the best of its ability.

The Assistant Secretary Mr. M. B. Sant could not much be spared this year also for touring work on account of pressure of office duties, especially as he had to devote considerable time in bringing out a Revised and Enlarged Edition of Directory of Indian Goods and Industries. The Fifth Edition of this book is now submitted to the Conference. Effort has been made to recast and revise the information contained in the last Fourth Edition of this book and bring it up-to-date with the help of all sources available to the Office of the Industrial Conference. Mr. M. B. Sant attended the last Third General Meeting of the Deccan Agricultural Association, Poona and visited a few industrial concerns etc. An account of his tour is appended to this Report. The brunt of the office work fell on Mr. M. B. Sant and his assistant Mr. G. R. Kshirsagar, both of whom performed their duties satisfactorily.

The Resolutions passed at the Seventh Indian Industrial Conference were in consonance with annual practice submitted to the Government of India, the Provincial Governments, as also to the Governments of principal Indian States for information and such necessary action as they may be pleased to take upon them.

The demand for the Directory of Technical Institutions in India steadily continues and the copies of this publication being now well nigh exhausted, a second Revised Edition is called for and the work will be taken up next year.

The demand for the Report of the Sixth Indian Industrial Conference held at Allahabad in December 1910, which was issued last year, has been very satisfactory, from the various Provincial and Local Governments and Darbars of Indian States. Out of the copies struck off very few are now on hand.

The sale of the Guide to Modern Machinery is going on steadily. The demand for this publication from the Darbars of Indian States and the general public is encouraging.

During the year under review, Industrial and Agricultural Exhibitions, cattle shows &c. were held in so many places in India, that it is not possible to notice them all. Attempt has been made, however, to describe a few of them, which owing to their importance, could not be ignored. They will be found described in Part II under the respective Provinces, in which they were held.

In compliance with the wishes of several friends and sympathisers with the Industrial Conference movement, it was seriously contemplated to organise something like a convention for the discussion of the Sugar industry, on a separate day immediately after the annual session of the Conference was over. But owing to the Royal Visit to Calcutta and other difficulties the project had to be given up. The deliberations of the Agricultural Conference which was held at Pusa and attended by official and non-official experts in Sugar industry are so exhaustive that very little now remains to be done ex-

cepting perhaps an effort on the part of Government and the people to carry out the several important Resolutions which were passed at that session.

Part II, Sections A and B are devoted as usual to a detailed description of the general industrial activity in the country including the steps taken by Imperial and Provincial Governments, in British India and the Indian States. For compilation of this information all available official and non-official sources have been fully utilized.

The lists of Indian patentees and of new companies registered during the year are appended to this report as annexures.

We beg to repeat our sincere acknowledgments to the Imperial and Provincial Governments, and the Rulers of the Indian States for the Annual Reports, and other departmental publications ungrudgingly supplied by them to the Conference office.

Statements showing the receipts and disbursements of the office of the General Secretary are hereto appended.

M. B. DADABHOY,

President,

Seventh Indian Industrial Conference.

R. N. MUDHOLKAR,

General Secretary,

30th November 1912.

Indian Industrial Conference.

*Summary of accounts of the Office of Indian Industrial Conference
for twelve months from December 1911 to November 1912.*

Receipts.	Amount.
	Rs. A. P.
Opening balance	2,978 0 3
From sale proceeds for the Directory of Indian Goods and Industries	199 10 6
Do Directory of Technical Institutions in India	105 8 6
Do Report of the 1st (Benares) Industrial Conference	12 15 0
Do 2nd (Calcutta) Do	2 9 0
Do 3rd (Surat) Do	9 7 3
Do 4th (Madras) Do	13 13 0
Do 5th (Lahore) Do	116 14 0
Do 6th (Allahabad) Do	1,041 5 0
Do Guide to Modern Machinery	216 3 6
Advertisements for the Allahabad Conference Report	6 0 0
Do Directory of Indian Goods and Industries (5th Edition)	80 0 0
From Lahore Reception Committee, through Deshi Beopar Mandal, Lahore	200 0 0
<i>Donations.</i>	
H. H. Late Maharaja Shree Ram Deo of Mayurbhanj	500 0 0
Sir R. N. Mookerjee, K. C. I. E., Calcutta	300 0 0
The Honourable Mr. M. B. Dadabhoy, C. I. E., Nagpur	300 0 0
The Honourable Sir Vithaldas D. Thackersey, Kt., Bombay	200 0 0
The Honourable Rao Bahadur R. N. Mudholkar, Amraoti	100 0 0
Dr. Harold H. Mann, Poona	100 0 0
Lala Harkishen Lal, Bar-at-Law, Lahore	100 0 0
Sir Dorab J. Tata, Kt., Bombay	100 0 0
Messrs. Morarjee Gokuldas & Co., Bombay	100 0 0
Meherban Shrimat Appasaheb, Chief of Sangli.	75 0 0
The Honourable Mr. P. S. Siva Swamy Iyer, C. S. I., Madras	50 0 0
The Honourable Mr. R. P. Karandikar, Satara.	50 0 0

*Summary of accounts of the Office of Indian Industrial Conference
for twelve months from December 1911 to November 1912.*

Receipts.	Amount.
	Rs. A. P.
Sir Bezoujee Dadabhoy, Kt., Nagpur ...	50 0 0
Shet Hanraaj Pragji Thackersey, Bombay ...	50 0 0
S. N. Pandit, Esquire, Bar-at-Law, Rajkote ...	50 0 0
Rao Bahadur Sardar Madhao Rao V. Kibe, Dewas. ...	50 0 0
Dewan Bahadur L. A. Govindaraghava Iyer, Madras for 1911 ...	35 0 0
Babu Ambika Charan Ukil, Calcutta ...	25 0 0
Rao Bahadur Khandubhai G. Desai, Surat ...	25 0 0
Shet Gulabchand Devachand Javeri, Bombay ...	25 0 0
The Honourable Mr. N. Subbarao Pantulu, Rajmundry ...	20 0 0
J. Chandhury, Esquire, Bar-at-Law, Calcutta ...	20 0 0
Sheo Prasad Gupta, Esq., Benares ...	15 0 0
Rao Bahadur V. R. Pandit, Nagpur ...	15 0 0
Rao Bahadur Wamanrao Mahadeo Kolhatkar, Nagpur ...	15 0 0
R. C. Banerjee, Esquire, Bar-at-Law, Calcutta ...	15 0
S. K. Nair, Esquire ...	15 0
Rao Bahadur V. N. Pathak, Satara ...	10 0
Babu Harendra Nath Sinha, Calcutta ...	5 0 0
V. V. Jogiah Pantulu, Esquire, Berhampore ...	5 0 0
Professor J. N. Samaddar, Bankipore ...	5 0 0
S. C. Roy, Esquire, Calcutta ...	5 0 0
N. Padmanabha Rau, Esquire, Madras ...	5 0 0
Rai Parbati Shankar, Calcutta ...	5 0 0
Debi Prasad Kaitan, Esquire, Calcutta ...	5 0 0
Pandit Gokarna Nath Misra, Lucknow ...	5 0 0
R. A. Deshpande, Esquire, Pleader, Amraoti for 1911 ...	5 0 0
Total ...	7,437 6 0

*Summary of accounts of the Office of Indian Industrial Conference
for twelve months from December 1911 to November 1912.*

Disbursements.		Amount.		
		Rs.	A.	P.
Pay of Assistant Secretary and other Office Establishment	...	1,578	3	9 ²
On Directory of Indian Goods and Industries account	...	62	13	0
On Directory of Technical Institutions in India do	...	30	2	6
On Report of 1st (Benares) Industrial Conference account	...	2	15	0
Do 2nd (Calcutta) do	...	0	9	0
Do 3rd (Surat) do	...	1	8	0
Do 4th (Madras) do	...	1	13	0
Do 5th (Lahore) do	...	15	12	0
Do 6th (Allahabad) do	...	218	7	0
Do 7th (Calcutta) do	...	1	8	0
On Guide to Modern Machinery account	...	80	4	9
Printing charges of the Annual Report on the work of the general activity in the country for one year ending with November 1911	...	139	12	10
Printing charges of the Report of the Allahabad (7th Indian Industrial Conference)	...	778	7	2
Printing charges of Guide to Modern Machinery	...	192	4	7
Refund of sale proceeds of the Benares Conference Report	...	10	0	0
Travelling expenses of Assistant Secretary and other charges incurred on tour	...	237	3	0
Printing (Miscellaneous Office forms &c.)	...	71	3	0
Postage	...	112	2	6
Telegrams.	...	16	4	6
Stationery	...	102	10	6
Purchase of books and periodicals	...	84	12	0
Railway freight &c.	...	12	14	0
Advertising charges	...	18	12	0
Furniture	...	97	6	0
Sundries	...	5	9	9
Lighting charges	...	5	4	0
Type-writer purchase, repairs and other supplies	...	510	5	0
Expenditure	...	4,388	14	10
* Balance	...	3,048	7	2
Total	...	7,437	6	0
* Out of this amount the following charges have to be paid :—				
Cost of printing the Report of the Calcutta Conference	Rs.	1,250	0	0
Do The Directory of Indian Goods and Industries 5th Edition	Rs.	1,000	0	0
Total Rs.		2,250	0	0

Amraoti, }
1st December 1912. }

R. N. MUDHOLKAR,
General Secretary,
Indian Industrial Conference

REPORT SUBMITTED BY THE ASSISTANT SECRETARY.

— :o: —

Owing to want of sufficient funds at the disposal of the Conference and pressure of office work, I could not, as pointed out by the General Secretary in his Annual Report, be spared for touring on an extensive scale for enlisting the sympathies of the educated public in the work of the Conference, by acquainting them with its aims and objects, for reviving the existing Provincial Committees and founding new ones to serve as fresh nuclei for the propagation of the industrial ideal. It is regrettable that this remark has to be repeated year after year, and no practical solution is yet in sight.

In the month of June last, I visited Poona and with the help of Professor V. G. Kale, Messrs. H. N. Apte and N. C. Kelkar, a meeting was organised at the suggestion of a few leading people of the place.

At this meeting the Hon'ble Rao Bahadur Mudholkar explained the aims and objects of the Industrial Conference movement and the work it has done so far and pointed out the facilities that exist in Poona and its neighbourhood for the development of sugar-making and other industries. A District Committee has been formed to popularize in the District of Poona the work of the Industrial Conference and to help the General Secretary's Office with funds and information that he may ask for from time to time.

During my stay at Poona, I visited the following Institutions and Factories :—

(1) The Factory of Messrs. Shah, Dunjee, Amthalal Brothers, which carries on the following work :—

(a) Flour grinding.

(b) Oil Pressing.

(c) Foundry work, Sugarcane Presses complete with accessories for Rs. 100 to Rs. 125, Railings and other cast iron work.

(2) Rice Hulling and polishing mill of Messrs. Mehen-dale & Sons, Shukrawar Peth, Poona City.

(3) Manual Art Society's School. The energetic proprietor of the school, Mr. Kulkarni, is trying his best to place the school on a proper footing. It has already secured Government aid and bids fair to be a useful institution. It teaches cabinet making, wood-carving and ordinary carpentry. The collection of samples of wood work which Mr. Kulkarni has got together, is probably the biggest that I ever met with. House decoration, sign board painting, clay modelling, fretwork etc., are also taught, along with Primary School Education in English and Vernacular.

(4) Poona Cutlery and Button Factory attached to the Nagnath Grinding Mill was also visited. Through the courtesy of its manager, I had an opportunity of viewing the different kinds of tools and small machinery used for the manufacture of penknives and scissors. The cutlery work is, however, in a languishing state as the proprietors find it very difficult to compete with cheap German imports which have nearly driven the English cutlery also from the market.

(5) The Metal Factory in Kasba Peth which has changed managers so often, is doing brisk work. It appears Poona is specially fitted for Brass and Metal Works, as this industry is in a very flourishing condition. Nearly 40 Articles of different sizes and shapes required for Hindu daily life are turned out. Brass and Aluminium plates are used for the purpose.

(6) Bhaskarnand Umbrella Factory of Mr. Rajmachikar is in a thriving condition. Instead of making complete umbrellas as before, the company is now turning out all the metal accessories required in a modern Umbrella Factory, which are about 8 or 9 in number excepting the ribs. The company employs about 75 hands daily and turns out 15 to 25 gross of

the component parts, which are sold at Rs. 14 per gross per set, with the aid of a 20 H. P. Engine.

(7) Ranade Economic Institute, which commenced its work last year has attracted a few students who are making experiments in cement, tanning bark and other materials, dyeing stuffs &c.

(8) Through the princely munificence of some of its patrons and well-wishers, the Fergusson College, Poona, has now been equipped with decent Laboratories for Physics, Chemistry, Botany and Zoology.

(9) Visited Mr. Paithankar's Commercial School. It makes provision for instruction in shorthand, typewriting, book-keeping and a few other Commercial subjects. Several other schools of this type have recently been opened in the Poona City for the convenience of students.

(10) Mr. Vartak, L. C. E., of the Poona Engineering College started an Oil-Pressing and Sugar Refining Factory, oil is extracted from til, groundnut, and Karadi seeds, on a small scale.

(11) Jog Mills of Poona is an old concern and through the perseverance and tact of its Proprietor, new features are almost every year being added to it. At present brass pots and other articles of daily use of about 40 different shapes and sizes are made in this factory. Candlestands, shoe-horns are also manufactured here. The surplus power in the Mill is utilized for grinding flour.

(12) From Poona, I proceeded to Talegaon to see the Paisa Fund Glass Works. Mr. Ishwardas Varshnei, who is the Superintendent there, was kind enough to show me the processes of making different glass articles, the moulds used for the purpose and other operations. The most remarkable thing about a Glass Factory is that it requires no machinery. A kiln with a few Iron pipes for glass blowing is all that is required. There is abundance of quartz about Talegaon, within convenience

distance. There are two courses prescribed : (1) theoretical and (2) practical. About 15 to 20 students are receiving instruction. The services of Japanese Glass Blowers have been dispensed with recently as this work can now be done by students under the supervision of Mr. Ishwardas. No fees are charged to the students, to whom free lodging is also provided. The students of the practical course are paid for their work within a few months of their joining the school, and every facility is afforded for learning the work practically.

In September, I attended for two days the third General Meeting of the Poona Agricultural Association held under the Presidency of H. E. Sir George Clarke, the Governor of Bombay and took part the next day in the deliberations of the Conference which offers every year an excellent opportunity of exchange of views on different Agricultural and industrial matters and brings together delegates from various Districts of the Bombay Presidency.

In October I proceeded to Akola, in Berar to attend the Maharashtra Sahitya Conference, and read a paper there advocating the necessity of original works and translations in the Vernaculars on scientific and technical subjects, for which there is an urgent demand all over the country and exhorted the educated classes not to fritter away their energies in writing works of fiction and other light literature.

M. B. SANT.

PART II.

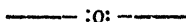
A brief account of industrial activity in India during the twelve months, December 1911 to November 1912.



Section A.

*The Governments of British India and Indian States,
and Industrial development.*

GENERAL.



In the beginning of the year under report the Government of India, decided to place Col. Atkinson, R. E., Principal, Thomson College, Roorkee, and Mr. T. Dawson, Principal of the Victoria Jubilee Technical Institute, Bombay on special duty for the purpose of investigating the requirements of the employers of labour and ascertaining how far they could be met from the existing institutions. The two officials have now submitted a very informing report embodying the result of their inquiries, which may be summed up thus:—

“Technical education in every other country has followed the organisation of industries or grown up alongside with them and it is, therefore, desirable that in a country where few industries are established, the wholesale education of the Indians could only result in excess of young men trained up for the posts which do not exist. Its success also depends on the general attitude of the student, since it is no use training a man in mechanical engineering, who will not do practical work or whose social customs make the manual work repugnant. The important question enquired into was the possible arrangements for systematic co-ordination between the institutes and the employers of labour so that they may work with each other. As regards the cotton mills, the Committee consider there are some openings for men with technical training but the demand is being met by the existing textile institutes. In the jute mills there is little or no opening, although Mr. Yule thought the subject

might form a branch of the Bengal Technical Institute. In Industrial Chemistry there are a few openings but no large or specialised demand at present. The railways who are largest employers of the technically trained Indians almost universally wish to employ and train the relatives of employees and have their own systems of training. In the Railway engineering department the existing colleges meet the present demands. Permanent Way Inspectors and skilled mechanics are wanted in larger numbers than are available and with regard to the engine driving, students from the technical institutions will not take up that line of work."

The Government of India have this year sanctioned the award of ten State Technical Scholarships to the candidates named below for courses of training in Europe in the subjects noted against each:—

FROM MADRAS.

Mr. Sakharam Rao Tambat for Electrical Engineering.

Mr. D. Sadashivam, Practical Works in applied chemistry and the manufacture of Textiles.

Mr. D. N. Nagarkatti, paper making.

Mr. E. L. Henriques, Architecture.

The last student to undergo a training for two years in India and then proceed to Europe for a third year course to complete his training.

FROM BENGAL.

Mr. P. R. Duncan, Mechanical and Electrical Engineering.

Mr. Chandra Sekhar Sarkar, Mechanical and Electrical Engineering.

FROM BEHAR.

Mr. Laksmi Das, Kochli for Tanning.

FROM PUNJAB.

Mr. Maung Ba Chitt, Mechanical and Electrical Engineering, subject to his passing the B. Sc. Examination in Burma.

FROM BEHAR.

Mr. B. Das, Mechanical and Electrical Engineering.

FROM CENTRAL PROVINCES.

Mr. K. Mitral, Electrical Engineering.

The Government of India have placed a grant of two lakhs of Rupees at the disposal of the Government of Bombay for the Victoria Jubilee Technical Institute.

A consignment of some cases of the triumph variety of cotton seed obtained through the British Cotton Growing Association, has been sent out by the India office, to the Agricultural Department Bombay for cultivation in Sind.

Some valuable suggestions have been made for the benefit of the lac Industry by the Forest Department in India in a pamphlet issued from the Government Press, Calcutta. It relates to the manufacture of shellac required for the trade of the cabinet maker. The result of the research conducted at the Forest Research Institute Dehra Dun, seeks to advise the manufacturer of shellac and its products, on the new methods which he should adopt to meet foreign competition. It is pointed out (1) that the present form of shellac in sheets is by no means suitable, (2) that the cultivation of the lac should be carried on either by the manufacturer himself or under his supervision and near the refinery to avoid adulteration and other impurities, which render the process of refining more difficult. It is possible that by careful selection the breed of the lac insect could be so improved as to yield a colourless lac of standard quality.

The Indian Forest Department has worked out a scheme for the establishment of Factories in suitable localities for the manufacture of bamboo pulp. The areas where bamboos grow luxuriantly and where it will be economical to set up factories have been duly surveyed. Mr. R. W. Sindall, a consulting chemist and wood pulp and paper expert has shown that there are great facilities in Burma for the erection of factories for making of paper pulp from bamboos. Various parts of Madras Presidency also, containing an almost inexhaustible supply of bamboo, would be eminently suitable for this industry.

The Sixth Conference of the Registrars of the Co-operative Societies in India was held at Simla from the 28th to the 30th October. Important resolutions were passed by the Conference and several valuable papers were read by official and non-official gentlemen, who had attended the Session of the Conference. Each Provincial Government was left as at present to fix its own Co-operative year. The subject of the rate of interest was introduced by Mr. Langley, the Registrar of the Punjab Societies. It was resolved, in the discussion that followed, that conditions are not yet favourable for a general reduction of the rate of interest. In respect of the Central Bank membership, it was of opinion that membership should not be confined to individuals. The meeting agreed to raise the minimum limit from Rs. 150 to Rs. 600. With regard to cattle insurance, it was decided that no action could be taken unless means existed of applying prophylactic measures. As regards the Government control, the Conference was of opinion, that it is at present undesirable to relax Government control over the auditing and inspecting staff. The staff should be under the Registrar and not under the control of the Central Bank or the Unions, and should admit of increase with the growth of the Societies.

Mr. William Raitt, F. C. S., Cellulose Expert at present attached to the Forest Research Institute, Dehara Dun has submitted recently a report on the results of his investigations into the possibilities of bamboo as a material for the production of paper pulp.

A very useful "Note on the antiseptic treatment of Timber in India, with special reference to Railway sleepers" has been prepared by Mr. R. S. Pearson, I.F.S., F.L.S., Economist of the Forest Research Institute, Dehara Dun. The book contains a record of the experiments conducted at Dehra Dun with a variety of solutions and is likely to be useful to all who are interested in the preservation of different kinds of woods from the destructive effects of insects and climatic influences.

Revised regulations have recently been promulgated, providing that all articles manufactured in India should by

preference be purchased locally, provided the quantity is sufficiently good and the price not unfavourable. All articles manufactured in India from imported materials should *by preference* be purchased in India, subject to certain conditions. The revised Rules give also a list of firms from whom iron and steel may be bought in India.

“Commercial Guide to the Forest Economic Products of India” is the title of a new publication compiled by Mr. R. S. Pearson, Economist of the Forest Research Institute, Dehra Dun. This book is intended for wide circulation and contains very valuable information regarding important timbers and minor products found in the State Forests all over India, and ought to be utilized by merchants, contractors, workers in Timbers and all others, who are interested in starting new industries.

BOMBAY.

The Bombay Government had appointed a Committee consisting of Mr. R. E. Enthoven, Sir Vithaldas D. Thackersey, Major Dickinson. I. M. S, Mr. Bradbury, Mr. Wadia and Mr. Engel, Inspector of Factories, Bombay Presidency, to consider the question of ventilation of textile factories.

The Secretary of State has sanctioned the appointment of an expert Mechanical Engineer for the inspection of pumping plants in the Bombay Presidency on Rs. 1,100 rising to Rs. 1,750 in three years. He will advice local bodies with regard to water works, drainage &c. and inspect pumping and other installations. He will also assist Government in framing schemes for the improvement of mechanical engineering.

The Honourable Sir Richard Lamb in moving the second reading of the Bombay Smoke Nuisance Bill, announced in March last, that the Bengal Government was asked for the loan of the services of one Inspector under the Bengal Smoke Nuisance Act to assist the Bombay Government in introducing similar measures in the interest of public health and property. Now that the Bill has been passed into Law it has thus become

incumbent on the owners of steam plant to overhaul their machinery to bring down the production of smoke to the prescribed limits.

Out of the candidates who had appeared in February last for the Mechanical Engineer's Examination under the Bombay Boiler Inspection Act, 4 passed in 1st Class and 37 in 2nd Class.

At the examination held in October 1912, 9 candidates passed in 1st Class, 32 in 2nd Class and 30 in 3rd Class.

The Government of Bombay have decided to institute a survey of the oil-pressing industry in the Presidency. Mr. Yashwant Ganesh Pandit who has acquired much experience of this industry in U. S. A. and in parts of India, has been specially appointed to undertake a survey. He will be employed for a term of six months with effect from the 1st October 1912. He is to visit all the important centres of this industry in the whole Presidency including Sind whether conducted in factories on a large scale or carried on by indigenous methods by country *Tellies*. He should make a thorough investigation of the methods and condition of the industry and submit a report.

Mr. Pandit is to investigate the following questions:—

(1) The oil seeds in use—

- (a) The district in which each oil seed is used.
- (b) The purposes to which the products are applied.
- (c) The areas of demand for the products.
- (d) The variations in the oil or other contents of the same seed in different districts.

2) The methods in use—

- (a) The special methods applied to each seed in use.
- (b) The quantity of all the resulting products from unit weight of seeds in each case and in each area.
- (c) The extent to which improved *ghanies* are used and the advantage derived therefrom.

(d) The extent to which power is used for driving indigenous oil-pressing machinery and the possibility of development in this direction.

(e) The extent to which any method is used to supplement the *ghani* in the oil-pressing industry and the possibilities in this direction.

(3) The lines of development, if any which the indigenous industry can take and the extent to which it can be supplemented by factory methods.

The Bombay Government Co-operative Credit Department is organising small Co-operative Credit Societies, which will undertake the supply of raw material to weavers and tanners at wholesale prices. The Government propose to assist such societies with loans to help them to start their business.

The inauguration ceremonies of the Ranchodlal Madholal College of Science and Chimanlal Nagindas Hostel for the students of the Gujerat College were performed in February last by H. E. Sir George Clarke, the Governor of Bombay. The former is the gift of Sir Chinubhai Madhavlal in memory of his grand-father the late Rao Bahadur Ranchodlal, the pioneer of cotton mill industry in Ahmedabad and the hostel is the gift of Mr. Ambalal Sarabhai in memory of his uncle Seth Chunilal Nagindas.

Mr. W. T. Pomfret, while serving as Acting Principal of the Victoria Jubilee Technical Institute, Bombay was deputed by the Government of Bombay to make a survey of the Handloom Industry in the Presidency. Owing to his sound practical knowledge of weaving, Mr. Pomfret has been able to offer valuable suggestions for the organisation of this important industry in his report, which is a very valuable compilation embodying the result of 12 months' work. While reviewing the Report of Mr. Pomfret, the Bombay Government has expressed a desire that practical demonstration of the work of improved looms should be arranged for on a more extended scale and His Ex-

cellency the Governor in Council is prepared to employ more men of the type of Mr. M. P. Gandhi if they can be found, and that as soon as trained men are obtained small weaving schools, should be started in Dharwar, Nasik, Bijapur, Ahmednagar and East Khandesh.

The Government have sanctioned a grant of Rs. 7, 500 for the erection of a small building in the compound of the Victoria Jubilee Technical Institute, Bombay for starting a handloom weaving department and carrying on a series of experiments in warping and sizing, and a recurring grant of Rs. 2,000 per annum to meet the cost of working the new department.

The Report of Mr. Pomfret, on which the Bombay Government have passed the above orders concludes with the following proposals which are reproduced below for the benefit of our readers :—

(1) To the native handloom should be attached fly shuttle motion, to enable the weaver to produce a greater length of cloth in a given time.

(2) New methods of warping and sizing should be introduced to lessen the cost of making the warp ready for the loom. Mr. Pomfret volunteers to do the work at the Victoria Jubilee Technical Institute under his personal supervision asking Government to give a grant of Rs. 2,000 for carrying on the work during this year.

(3) At the above institute, a handloom department be started for the special benefit of the handloom weavers with a view to training weavers to take up the position of teachers in weaving schools, which may be started in different parts of the Presidency.

It is very gratifying to note that the committee referred to in last year's Report which was appointed by the Bombay Government to investigate the question of standardisation of weights and measures is earnestly trying to grapple with the

problem, under the direction of the Honourable Mr. J. P. Orr. The *ad interim* report of this Committee recognises the difficulties of their work and the necessity of collecting further information. Excellent work appears to have been done in the West Khandesh and Nasik Districts. In a few places, new weights and new measures were issued, the old ones being destroyed and the material returned to the owners. It is hoped that as the importance of this matter becomes more generally known, the people will by degrees insist on the same correctness as they now find in the coinage.

The Right Honourable the Marquis of Crewe, Secretary of State for India, accompanied by His Excellency the Governor of Bombay paid a visit in December last to the Victoria Jubilee Technical Institute, Bombay. The Secretary of State was shown over the Institute and evinced much interest in what he saw.

Mr. H. Meikle of the Oriental Government Security Life Assurance Company has been appointed Government Actuary, Bombay with reference to the Life Assurance Legislation.

Under the supervision of the Principal, Agricultural College, Poona, an Agricultural School has been opened where free instruction is given through the medium of *Marathi* to sons of farmers. Scholarships are awarded to students to cover their lodging and boarding expenses. This class is being largely availed of by cultivator's sons in the Bombay Presidency.

Along with the genuine efforts of the Local and Provincial Governments in undertaking industrial surveys and investigating particular branches of it, which deserve a separate inquiry, it is gratifying to note that the University of Bombay is also trying to help this problem by selecting very useful subjects for some of its Prize Essays. In 1910, the subject for the Ashburner Prize was "History of Indian industries during the last century," and "Copper, Brass and Aluminium Industries in India" was the subject selected for 1912. The prizes for both the essays were won by Professor P. G. Shah, M.A., B. Sc.

of Forman Christian College, Lahore. Both the essays are excellently written and deserve a wider circulation.

MADRAS.

A committee composed as under has been appointed by the Madras Government to report upon the improvement of industrial and technical education in the north of Madras :—

The Hon'ble Mr. Alfred Chatterton, *President*.

Mr. H. E. Harris, Managing Director, Messrs. Massey & Co.

Mr. A. Carnall, Manager, Reliance Foundry.

Mr. J. W. Anderson, Manager, Madras Cement works.

Mr. Haridas Vissenji, Agent, Madras United Spinning and Weaving Mills Co., Ltd.

Mr. H. B. Peirce, General Superintendent, P. W. Workshop.

The Manager of the Beehive Foundry.

Two officers of the Madras and Southern Mahratta Railway Co.

The Government of Madras have decided to utilize the experience in silk rearing gained by the Salvation Army officers at their silk farm near Bangalore by deputing an Agricultural Assistant to the farm for a period of six months to study the improved methods of silk rearing and spinning followed there and to prepare pamphlets in the Vernaculars giving clear instructions on those subjects for the benefit of the Kollegal and other people who carry on the industry as a hereditary profession.

In our last year's Report we have referred to the appointment of a Tinctorial Expert by the Madras Government for the purpose of investigating the dyeing industry of the Presidency and to propose means for its improvements. Dr. Marsden, who was appointed as the Tinctorial Expert has since submitted his report and in passing orders thereon the Government have

accepted the recommendations of the Director of Public Instruction and the Honourable Mr. Chatterton that Madura should be selected as the headquarters for a detailed study of this industry and the methods followed by Indian dyers.

The Government of Madras have sanctioned an allotment of Rs. 10, 000 for the purpose of establishing a Central Jaggery Factory on a small scale in the Noyel valley in the heart of the sugarcane tract of the Coimbatore District.

The Government of Madras has sanctioned to the Madras Glass Works Co., Ltd., the right to collect half the wood used by them for two years subject to a maximum of 7,200 tons, free of all royalty from the Government forests.

A new leaflet describing the method of sowing Cambodia cotton has been issued by Mr. H. Southern, Deputy Director of Agriculture, Trichinopoly. It points out the importance of sowing pure seed. While Mr. R. C. Wood, Principal of the Agricultural College, Coimbatore, has written a leaflet on the use of the drill in sowing cotton.

Dr. Barber, Economic Botanist to the Madras Government, has been appointed by the Secretary of State to direct the working of the acclimatisation at cane-breeding stations which it is proposed to establish at Coimbatore. The total cost of the scheme is estimated at Rs. 2½ lakhs. Dr. Barber's appointment will last for five years.

It is contemplated shortly to start a big Factory for the extraction of Eucalyptus oil at Ootacamund.

BEHAR

The seventh meeting of the Board of Agriculture was held at Pusa on the 20th November 1911. About 70 members and visitors were present. This Conference introduced several new features in its work. In the first place, an attempt was made to concentrate the attention of the Conference to the discussion of only one important branch of Indian agricultural

industry, to collect all available information on that subject and to see how far improvement could be effected therein. The subject selected for discussion last year was the "Sugar industry", with the help of non-official and official experts.

On the agenda sheet there were also the following items:—

(1) Best means of bringing the results of experimental work to the notice of cultivators.

(2) Manures, their conservation, and economical manures available in the country.

(3) Oil-pressing industry and the best means of extending it.

(4) The duties of Agricultural Associations in India.

(5) The general lines to be pursued in the development of the organisation of scientific research in the Provincial departments of agriculture.

(6) Maintenance of pure seed of improved varieties of crops.

(7) Cotton investigation in India and the note thereon by the Inspector General of Agriculture.

While dealing with the Sugar Industry the following points were discussed:—

(a) The improvement of the indigenous Industry.

(b) The production of refined sugar which is now imported.

(c) The possibilities of extending the area under sugar-cane in India.

The resolutions passed by the "Sugar Board" emphasised the necessity of (1) appointing a sugar Engineer, (2) a preliminary survey under chemical control of the existing canes, (3) the establishment of an acclimatisation and cane breeding station at Madras for the whole of India, (4) production of

'better canes with purer juice and giving an increase of tonnage per acre, (5) increase of area under cultivation by more efficient methods, (6) reservation of certain suitable areas for establishment of Central factories, (7) authority to local Governments to help pioneer factories by subsidy, by taking deferred shares, or by other appropriate means.

Mr. Lefroy, the Imperial Entomologist has suggested a system of hybridising for the improvement of Indian Silk industry, by the introduction of foreign worms. To give effect to this proposal, the services of a first rate French expert, who has had special training in the principles of mendelism and skilled hybridising, are being engaged. A big firm at Lyons, having an office in Calcutta which is co-operating in the scheme has contributed financial help and the experiments are to be made for a period of five years.

The establishment of an industrial exhibition at Bankipore, has given an impetus to various industries and specially to the production of cotton on a commercial scale, while the silk and cotton weaving industries have been greatly revived by the weaving school started in that province.

PUNJAB.

The Punjab Government has offered a grant of five to seven thousand Rupees a year to the Umballa Glass Factory. The object of the grant is to encourage the owners of the factory to persevere in their attempt to specialise in glassblowing on condition that a practical chemist and blower be employed and arrangements made for training 5 to 10 apprentices at a time, three of whom at least should possess university qualifications in science. The scheme, it is expected, would attract a few qualified graduates.

In Kulu, experiments were carried out for improving the fleece of indigenous sheep by cross breeding with merino rams. Out of 25 merinos imported last year about 10 survived. The young stock is reported to be hardy and promises to give very good wool.

The Government of the Punjab have selected either pottery or tanning as the industry to be encouraged during the current year by the award of a state technical scholarship.

It appears from the last annual Report submitted by the Director of Public Instruction, Punjab that there is an exceptionally large number of institutions for imparting professional and technical training in that Province. At Lahore, there is the Mayo School of Arts, the Railway Technical School (financed and managed by the Educational Department), and the Engineering School which is being removed to Rasul on a more ambitious scale. There are commercial, clerical, industrial and technical schools at Amritsar, Ludhiana and Delhi. The Industrial Conference held last year at Lahore, has made practical recommendations which if carried out will result in the substantial expansion of technical education in the Punjab. The site of the new Engineering College for the Punjab has been fixed at Rasul which is the head-quarters of the Jhelum canal. The college is intended to accommodate a hundred students.

A Registry office, is maintained by the Principal of the Thomson College, Roorkee for Engineers, Overseers, Sub-Overseers, draftsmen, surveyors, motor-car drivers, engine drivers, men trained in Photo Mechanical and lithographic work &c. Employers in need of any such persons are requested to apply to him.

UNITED PROVINCES.

A new experimental farm is opened in the Aligarh District and another at Cawnpore for the purpose of distributing seeds of approved strain. There is a similar farm at Banda, which is the third principal cotton growing tract in the United Provinces.

In a circular, the Principal of the Thomson College, Roorkee, has drawn the attention of the public to the opening of the higher division of Technology at this College.

This higher division comprises two Sections—(i) Textile and (ii) Electrical and Mechanical Engineering. The 2nd section is arranged to prepare students for employment in other than the above capacity on electrical and other power installations. The students in these sections, after they have acquired the needed experience, would be able to take charge of electrical plant, to contract for the supply of electrical power, and material and to take charge of Stations of large electrical supply companies.

In reply to a letter addressed by the U. P. Government to the Upper India Chamber of Commerce, inviting their opinion as to the class of manufactures in which it is essential, that the chemist with practical experience should be appointed, the Committee of the Chamber state that it would be quite impossible to find out a chemist who was an expert in such a wide range of subjects. They considered that the man at the head of the Cawnpore Technological Institute should have a good knowledge of Chemistry of manufacturing processes.

The Progress Report of the Forest administration of these Provinces, shows that the profits earned in the Turpentine industry during the year 1910—11 were more than double those of the previous year due to an abnormal rise in the price of that article. There was a satisfactory demand for both rosin and turpentine during the current year also.

The Government of the United Provinces is prepared to receive applications for technical scholarships of £150 a year each tenable for 2 years to enable the holders thereof to proceed to England or other western countries for instruction in mechanical engineering, electrical engineering, or manufacture of paper.

Aligarh has been selected for the location of a cotton experimental farm for studying the types of cotton grown in the surrounding districts, and as this is the centre of a large area of about 7,500,000 acres of cotton, there is much scope for introduction of new varieties and the improvement of existing ones.

The Rules in connection with the Industrial School established at Lucknow have recently been published. The Session commences on 1st August and there will be three departments in the school; the junior class, the mechanic class and the artisan class.

BENGAL.

The Bengal Government has decided in consultation with the representatives of the mercantile and industrial communities of Bengal that one candidate will be recommended for a state scholarship for instruction in Mechanical and Electrical Engineering. The scholarship is worth £150 a year and is tenable for two years.

CENTRAL PROVINCES.

It appears from the Report on the Agricultural Stations in the Central Provinces and Berar that the use of agricultural machinery is becoming very popular among the Zamindars and ryots of these Provinces. Winnowers are in considerable demand and a simple machine for blowing the chaff from the corn without the necessity of sifting or grading the grain, which costs only Rs. 40 has been designed.

An Agricultural Conference was held last month at Akola in Berar, which was largely attended by Directors of Agriculture, Revenue Officials of Government, Malguzars, and others interested in the promotion of agriculture. Agricultural machinery, implements, samples of cotton and other agricultural products were exhibited.

The first Co-operative Conference in the Central Provinces met at Nagpur on the 18th December. Mr. Fox-Strangways, the Financial Commissioner to the C. P. Government opened the Conference. Papers were read by Rai Bahadur Vishnu Dutt Sukal of Sehore, Mr. Narayan Rao Kelkar of Balaghat, Mr. Crosthwaite, Mr. Gulam Ahmed and other gentlemen.

ASSAM.

An examination for 1st and 2nd class Coal Mine Manager's certificates of competency was held in February last at the offices of the Mines Department at Dhanbaid.

The Government of Assam had invited tenders for the purchase of the whole quantity of Rubber from the Government plantations, which will be collected and packed by the Forest Department during 1911-12. It is estimated that the Char-duar plantation alone will yield about 10,000 lbs. and the Kulsi plantation 3000 lbs. It is reported that Government is desirous of disposing of these plantations if a suitable purchaser is found.

It is decided to try an experiment at Shillong in silk culture. The local Roman Catholic Mission has undertaken to conduct the experiments with the Government sanction. The Orphanage Mission will provide a rearing house and the Agricultural Department is to provide an expert, and a free supply of mulberry leaf.

MYSORE.

The Hon'ble Mr. Alfred Chatterton has been appointed by the Mysore Government as Inspector-General of Education and Director of Industries. Much valuable work is expected from the Hon'ble Mr. Chatterton, with his wide experience in educational and industrial matters.

In honour of the Coronation of His Majesty the King-Emperor, the Bangalore Commercial High School has established 10 free and 20 half-free scholarships, tenable for a period of 18 months beginning on the Coronation day, the 12th December.

KASHMIR.

In the Kashmir State experiments are in progress under the supervision of a European weaver in silk weaving on looms imported from England.

IDAR.

A large quantity of stealite stone of a very fine quality has been discovered in the Idar State. Those who wish to buy the mine or take a lease for quarrying should write to Dewan Amrao Singh of the State.

TRAVANCORE.

Nearly 45,000 acres are at present under Rubber cultivation in Malabar. The Peryar Rubber Co., and the Kani Travancore Co. are harvesting large quantities of Rubber every year for export.

A Carpentry School has been started at Quilon under the management of the Travancore Darbar and conducted for two years as a trial.

PART II.

Section B.

THE INDUSTRIAL ACTIVITY OF THE PEOPLE.

GENERAL.

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An analysis of the exports of British Machinery shows that India is the best customer of the Machinery manufactured by the United Kingdom, as this country alone purchases nearly as much machinery as all the other British oversea possessions put together. This is a clear proof that India is beginning to develop her industries and requires an immense amount of Machinery to supplement her manual labour. There is also another fact worth noticing that much of this Machinery is now under the direct control of the Indians themselves.

15th March 1912, may be recorded as a red letter day in the annals of the Iron and Steel industry of India as on that day, the first consignment of rails was successfully manufactured at the Tata Iron and Steel Works Ltd., at Kalimati, and the rails were tested by Government experts as regards their efficiency. They have been pronounced as thoroughly suitable for railways.

Mr. Ganesh Balwant Limaye of Poona has given a sum of Rs. 25,800. for the purpose of awarding a scholarship of Rs. 75 per month payable for 3 years, to a deserving student to enable him to proceed to Japan for study. If, however, the trustees are of opinion that equal facilities for a particular post-graduate course exist in India and the scholar is likely to derive from it as much profit as he would get by proceeding to Japan, the scholarship may be given in India.

The output of coal in India during 1911, was the largest on record for the past ten years except probably in 1908. It was 12 million tons and there were about 1 lakh persons employed in the industry.

The Industrial activity in the whole country during the year 1912 may be gauged from the figures given below :—

Joint Stock Companies registered during the year.

	Total No.
Banking, Loan and Insurance	103
Trading (Printing, Publishing and Stationery) ...	15
Do. Miscellaneous	59
Mills and Presses	13
Mining and quarrying	13
Tea and other Planting	16
Other work	3

BOMBAY.

For introducing electrical power in textile factories in India, Mr. W. A. Bristow, the representative of Messrs. Siemen's Brothers, Dynamo Works, London has arrived in India, and it is hoped that the practical knowledge of Mr. Bristow will be of great help to Indian Mill owners.

The annual Report on the working of the F. S. Parekh Technical Institute at Surat, shows that the Institution is making a steady progress. The number of students who completed the 3 years' course in 1909, was 30 and that for 1910 was 28. The number of 2nd Grade Art Certificates granted during the year was 10 and that of 3rd Class Engineer's Certificates was 33.

The Indian Cotton Oil Co., Limited, of Naosari commenced its work in September 1911. The products of this factory have been pronounced by experts as fully equal to American makes, and they find a ready sale both in India and in England at remunerative prices. The refined oil is now being used by the public for culinary purposes.

The Directors of the Swan Mills, Bombay have entered into a contract with the Tata Hydro-Electric Power Supply Company Limited, for the supply of electric power, as they are

confident that on the whole electric power will be more advantageous than steam. The supply from the Tata scheme will be available within about 2 years.

Trustees of the Gimi Educational Trust at Navsari Chambers, Fort, Bombay award to Parsi graduates and undergraduates scholarships ranging from Rs. 60 to Rs. 150 per mensem to enable them to prosecute higher studies in scientific, technical and industrial subjects and in pedagogics in India, Europe or Japan.

The scheme for construction of a Tramway between Andheri and Versova promoted by Messrs. Ruttonjee Dossabhoy Curranee and Company is making satisfactory progress, and the company will shortly be floated with a capital of 2 lakhs.

From the results of the London Chamber of Commerce Examinations published recently by the Director of Public Instruction, it appears that there are about 25 private and Government Institutions for imparting commercial instruction. In the Senior Certificate Examination of 1912, the total number of successful students was 123 and in the Junior Certificate course 27. Out of this number only 34 Hindus passed in the Senior and 9 in the Junior course, the majority of the students belong to the Parsee community, who seem to appreciate the importance of Commercial education and have ample openings to utilize it.

A protest has been made by the Bombay Mill Owner's Association against the proposal of the British Cotton Grower's Association to establish a cotton growing agency in Sind. They contend that if the British Company establishes an agency for buying up the long stapled American Cotton produced in Sind, this Cotton will not be available to the Indian Mills. A few prominent members of the Bombay Mill Owner's Association are ready to form a syndicate with the necessary capital to co-operate with the Bombay Government for the purpose of experimenting with American Cotton in Sind and to establish an agency for the supply of this Cotton to the Indian market.

In a leaflet published by the Agricultural Department, Bombay, the Iron Mhot manufactured by Messrs. Bhide and Sons of Sangli, has been pronounced as the best after proper examination and practical test. It is also comparatively cheap.

Sir Jagmohandas Varjeevandas Madhavdas of Bombay has offered a sum of Rs. 2½ lakhs for endowing a chair in commerce. The offer has been thankfully accepted by the Bombay Government.

The late Dr. Manekshah Gimi of Baroda left by his will securities amounting to Rs. 1,10,000 for establishing scholarships for Parsi students on the same lines as the Tata Scholarships. The interest of this sum is to be applied for giving advances to deserving Parsee Students to enable them to proceed to foreign countries to acquire proficiency in science.

A public meeting was held in October last, at Madhav Bag in Bombay under the Presidentship of Sir Bhalchandra Krishna to acquaint the people with the progress that has been made by the Paise Fund Glass Works of Talegaon near Poona and to appeal for funds to extend the usefulness of this very deserving institution. Dr. M. G. Deshmukh who is one of its well-known promoters gave a short history of the Factory and pointed out how well the works have been thriving under the superintendence of Mr. Ishwardas. Nearly all the articles of daily use are now manufactured at Talegaon, which has already trained about 10 students in all the branches of glass making and are now prepared to start business independently, if their services are utilized for establishing Glass Works in other suitable centres.

Among the applicants for patents from the Bombay Presidency during the year, Mr. Jehangir S. Banaji of Bombay obtained patents for improvements in Electric dynamo and alternator and in current distributing system, and another for improved high efficiency electric incandescent lamp and holder.

Patents have been granted for steam cookers to nearly half a dozen applicants from the Bombay Presidency.

Mr. Tuljaram Muljee Divecha, Superintending Engineer for the Aryodya, the Bharatkhand and a few other Ahmedabad Mills, has been elected a member of the Institute of Mechanical Engineers, London. Mr. Divecha was apprenticed in a cotton mill at an early date and is now one of the oldest Engineers in Ahmedabad.

The Sisters of All Saints, have opened an institution at Mazgaon (Bombay) where a genuine artistic industry has been carried on ; with a few pounds of hard forest seeds, necklets, muff chains, curtain loops, hatpins, napkin rings &c. are manufactured and their excellent designs have attracted the patronage of Her Majesty the Queen-Empress, when in India five years ago. This seed and bead Industry is carried on for the charitable work of the Sisters.

Two scholarships in connection with the Tata Education scheme were offered during this year by the Secretary of the Scheme, Navsari Building, Bombay to enable the students to proceed to Europe for acquiring special knowledge in any departments of science, art or Engineering or for fitting themselves to enter higher grades of Government service.

The latest Report of the Hindu Education Fund to hand, shows that during the last six years, 12 students were helped out of the fund for different branches of study. Of these 2 competed for the I. C. S. and now occupy high posts in the Imperial Service. Two students finished their courses of applied chemistry by one in Japan and the other in Germany. One student, who is a distinguished graduate of the Allahabad University obtained the degree of Ph. D. in Germany and after having gone through a course of practical work for one year as an apprentice in a large color Factory in Houghton-maine is now selected a tutor for the next year in the same Institution at Charlottenburg from which he graduated. One student has completed his course in sugar manufacture in America and has returned to India, another who was sent to England to study dyeing and bleaching in Birmingham University had to

come back under medical advice. Out of the 23 students sent in all by the fund, 6 went for I. C. S., 1 for I. M. S., 7 for manufacturing chemistry, 5 for Electrical Engineers, 1 for sugar, 1 for pharmacy, 1 for agriculture and 1 for Commercial Education and Banking. There is thus a judicious selection of subjects.

The following is a list of persons who have been awarded medals at the last Royal Bombay Exhibition :—

TEXTILES.

Bombay Dyeing and Textile Mill: Two Gold medals, one for colored cloth and the other for bleached cloth.

Bombay United Mill : Gold medals for khaki and bleached cloth.

Khatao Mackenzie Mill, Bombay : Silver medals for khaki and bleached cloth, and gold medals for dyed cloth.

Calico Mills, Ahmedabad : Bronze medal for printed goods.

Shri Ramkrishna Mill, Ahmedabad : Silver medal for Dhories, bronze medal for handkerchief.

Edward Mill, Beawar : Gold medal for gold bordered fine Dhories, Silver medal for tussore silk pieces.

Broach Industrial Mill : Gold medal for High Count Egyptian yarns 60—100.

Fine Knitting Co., Ahmedabad : Gold medal for Hosiery.

Gujerat Weaving Factory : Gold medal for natural tussore silk pieces.

Sir Currimbhoy Ebrahim & Co., Bombay : Silver medal for bleached cloth.

GENERAL EXHIBITS.

G. P. Stavrides : Gold medal and Grand Prize for the great variety, and excellent design of his goods.

Bai Mythilee, Mysore: Bronze medal for a woollen carpet.

**Jubburkhan*: Silver medal for carved wood screen, Silver medal for papier-mache work.

Subbarao, Bangalore: Silver medal for wood carving.

SAFES AND LOCKS.

Gold Medal for Godrej and Boyee, Silver Medal for Hari-chand Mancharam & Son, and Bronze Medal for M. Chhaganlal & Co., all from Bombay, Silver Medal for the Sparling Lock & Co., (Aligarh).

TRUNKS AND BOXES.

Gold Medal for Goolam Hussein Ismailji and Brothers.

A new Saw Mill has been started at Bombay by Mr. M. Chotani which is equipped with Engines and Boilers supplied by Messrs. Marshall, Sons & Co., Ltd., and Sawing Machinery by Messrs. Ransome and Co., Ltd.

An Industrial Exhibition organized by the Salvation Army was held in the Town Hall on 3rd and 4th October, under the patronage of His Excellency the Governor of Bombay. The Exhibition was divided into the following sections:—

(1) Work among the Criminal Tribes and industries carried on by these tribes.

(2) The silk Industry.

(3) The Handloom Weaving Industry.

(4) Lace, drawn thread and needle-work.

(5) Arboriculture and educational specimens.

The question of electrification of the Railways within the Island of Bombay is engaging the attention of the Boards of the G. I. P. & B. B. & C. I. Railways and the authorities of the

Port Trusts have also agreed to share the cost of obtaining expert opinion. Full information will, it is hoped, be shortly available with the help of Mr. Merz, who is an authority on the subject.

The Pearl Mills Ltd., is the title of a new Spinning and Weaving Mill which is being started at Bombay with a capital of 25 lakhs of Rupees divided into 10,000 shares of Rs. 250 each. Among the Directors are to be found names of Veteran Mill owners like the Hon'ble Sir Sassoon David, Sir Jamsetjee Jeejeebhoy, Sir Currimbhoy Ebrahim and others.

Under the auspices of the Deccan Agricultural Association, Poona, an Agricultural Conference was held at Chinchwad, a village near Poona, where about 100 prominent cultivators from the surrounding villages had assembled.

The following are the principal Banking concerns floated in the Bombay Presidency during the year under report :—

The Pioneer Bank, Bombay.

Indian Peninsular Bank, Hubli.

Luxmi Bank, Poona.

Deccan Bank, Hubli.

Central Bank of India, Bombay.

Crown Bank of India, Shikarpur (Sind).

Jain Bank, Ahmedabad.

National Financing and Commission Corporation, Bombay.

Standard Bank, Bombay.

The Hon'ble Sir Sassoon J. David, the Millionaire of Bombay has placed a sum of about 8 lakhs of Rupees at the disposal of the Bombay Government which is to be applied to the following purposes :—

(1) To open agricultural schools in villages for instruction in Vernacular to the sons of farmers.

(2) To help Government officials and private individuals, in making experiments in farming and in the manufacture of agricultural implements.

(3) To open hostels for agricultural students studying in Government or aided institutions.

Mr. Ratan J. Tata, presiding at the recent annual general meeting of the Tata Iron and Steel Company Ltd. had a most satisfactory account to give of the prospects of the company. He stated that the two blast furnaces are now completed, while the troubles in connection with the steel furnaces are nearing their end. The largest monthly output of steel has so far not exceeded 1,500 tons, but it is expected very soon it will be 5,000 tons and will gradually work up to the maximum of 7,000 tons. The quality of the steel has been widely appreciated and already orders for 100,000 tons have been booked. Japan is the company's largest customer and can take all the output at a very profitable rate. The rolling and bar mills have also been started and are turning out steel equal to British steel. The report of the directors was adopted and a dividend at the rate of 6 per cent on the preference shares was declared.

The Niagara Trading Co. has established a Laundry at Poona for the purpose of washing clothes and also for dyeing work.

The Government of Bombay have received the following generous promises of support for the establishment of a College of Commerce in Bombay:—

Sir Jugmohandas Verjeevandas—2½ lakhs for founding a professorial Chair to bear his name.

The Trustees of the Wadia Charities have handed over Port Trust Bonds yielding Rs. 4,800 per annum for founding a chair in the name of Mr. N. M. Wadia.

Sir Chunilal Madhavlal—one lakh Rupees.

The Bombay Chamber of Commerce—Rs. 1,500 per annum.

The Mill Owner's Association, Indian Merchants' Chamber and Bureau, the Bombay Native Piece Goods Merchants' Association, and the Mill Owner's Association, Ahmedabad—Rs. 1,000 each per annum.

The income from the above sources is estimated to amount to about Rs. 23,000 per year and the Government are prepared to contribute an annual grant of Rs. 15,000. It is hoped that the College will commence work next year, with a staff of 2 Professors, (one to act as Principal) and two Lecturers. This College will be the first of its kind in the whole of India and is designed to provide for sound Commercial education not only to the growing needs of the Presidency but generally for the whole of India.

The following Co-operative Societies have recently been Registered in the Bombay Presidency:—

(1) The Canarakhatriya Urban Co-operative Credit Society.

(2) The Nahavar Rural Co-operative Credit Society.

(3) Huriwn Hipparagi Rural Credit Society.

(4) Sholapur Weaver's Urban do.

(5) Poona District Urban do.

The Katni Cement and Industrial Company Ltd. has been formed at Bombay with a capital of 20 lakhs of Rupees for the purpose of the manufacture of Portland Cement, roofing and other varieties of tiles, sanitary glazed pipes, bricks and china clay, lime &c. The Hon'ble Sir Sassoon David, Bart, Sir Vithaldas Thackersey and a few other prominent men are among the Directors.

The results of the City and Guilds of London Institute Examinations held in the Victoria Jubilee Technical Institute, Bombay have been received. Out of 32 students of the Institute, entered for the Cotton Spinning Examination 28, or 88 per cent passed. All the 31 students, who had appeared for the Cotton Weaving Examination, were successful, viz., 14 in 1st Grade, 13 in 2nd Grade and 4 in Honors Grade. Out of 17 students 6, or 35 per cent passed in Mechanical Engineering and out of 39 students 21, or 68 per cent passed in Electrical Engineering, in motor car Engineering 7 out of 14, in Telegraphy 7 out of 20, in Telephony 4 out of 8.

BENGAL.

The Calcutta Electric Supply Corporation have found it necessary to build a large generating station on the River side at Cossipore to cope with the increasing demand for Electric power for driving Factories. The amount of plant which is being installed at Chitpur Generating Station is equal to 10,000 . P.

The Manager of the Titagarh Jute Mill has started the Argus Jute Mill with a capital of a million sterling in which American buyers have taken a large portion of the shares. This is probably the first time when American capital has been so largely subscribed in a Calcutta Mill.

A certain Calcutta firm is reported to have secured a valuable concession from the Bengal Forest Department for the extraction of Bamboos from certain reserved forests in the Darjeeling District for the manufacture of paper pulp.

It is estimated that the total profits of the Calcutta Jute Mills for 1911 amounted to Rs. 49½ lakhs against Rs. 76 lakhs and Rs. 70 lakhs in 1910 and 1909 respectively.

A Joint Stock Company under the title of F. F. Chrestien and Co. with a capital of Rs. 37,500 has been registered at Koderma, Bengal for the manufacture of wall-papers.

The Calcutta Tanning Syndicate with Messrs. Speyer & Co., as the Managing Agents have started turning out both chrome and bark tanned hides and skins from their tannery at Kidderpore. The Tannery is equipped with the most up-to-date Machinery and is now in full working order.

Mr. Parks, the American Expert is engaged in investigating the present condition of the jute industry and to suggest a workable plan to secure a concentration of interests.

An emery cloth and paper mill will shortly be established at Calcutta on a site selected near the B. N. Ry. The scheme has also in view the manufacture of a number of abrasive articles now produced by German Manufacturers.

A modern high tension electrically driven flour mill, the first of its kind in India, was formally started by Mr. A. M. Monteath, President of the Calcutta Chamber of Commerce.

Mr. Taraknath Palit, the wealthy Calcutta Philanthropist has made over to the Calcutta University property worth over seven lakhs of Rupees for the foundation of two professorships, one of chemistry and the other of physics and for the establishment of a University Laboratory. The University, it is understood, will build and equip the laboratory at a cost of not less than 2½ lakhs and to maintain it in an efficient state. It will also supplement the gift by a suitable contribution from the Reserve Fund and with the combined funds, first steps will be taken towards the foundation of an University College of Science and Technology. The Senate also resolved to record their feeling of gratitude towards Mr. Palit for his munificent gift by placing a life-size portrait of Mr. Palit in oil in the Senate Hall and that a marble statue of Mr. Palit in front of the proposed College of Science.

Among the students, who have recently completed their courses in foreign countries with the aid of the Scientific and Industrial Association of Bengal, a few deserve special mention. Mr. R. N. Das has obtained the M. Sc. degree in agri-

culture of the University Missouri (America) and also a research scholarship of Rs. 750, a year. Mr. K. N. Roy obtained the M. Sc. degree in Mining Engineering from the University of California, Mr. C. Ghose has obtained the Fellowship of the worshipful company of spectacle makers and also passed the examination for the membership of the British Optical Association. He has also obtained the Freedom of the City of London, which is a rare distinction for an Indian.

MADRAS.

The extraction and cleaning of palmyra fibre for export to Europe and America for the manufacture of brooms, coarse brushes and numerous other industries is becoming an important trade in South India.

New Ginning Factories are to be opened at Pollachi, Tirupur, Palamedu, and Jamatra in the Coimbatore District.

Palmyra fibre worth Rs. 11 lakhs was exported from the Madras Presidency during the 9 months ending with 31st December, 1911 to the United Kingdom, Germany, Holland, Belgium and the United States of America.

At the Tirupur Cattle show held in May last, the Honourable Mr. Alfred Chatterton delivered a very interesting address on "well-irrigation in Coimbatore". He pointed out the methods by which the problem of irrigating the fields in the District may be satisfactorily solved. The Hon'ble Mr. Chatterton advocates the use of mechanical appliances for that purpose.

The following principal Banks were started in the Presidency :—

Coonoor Subramania Vilasa Upakara Nidhi, Coonoor.

Three Nidhis started, at Coimbatore.

One Nidhi at Nellore.

A mining firm of Calcutta has deputed Mr. I. C. Incinerny, mining prospector, to explore several places in the Guntur

district where years ago there were large diamond fields whose cessation of work no living man nor history could, account for. He is at present carrying on explorations at Kollor in the Kistna District where, it is said, that the best diamond, the Kohinoor, was first discovered.

BURMA.

A Factory has been established in Rangoon for the manufacture of paper from Bamboo pulp.

CENTRAL PROVINCES.

Asbestos of a very superior quality has recently been discovered in a large tract in Chhota Nagpur. The deposits, it is estimated will cover at least six miles. The first discovery was made at a place nearly eight miles from Chakradharpur.

The Central Provinces are noted for the extremely rich and valuable manganese deposits, scattered all over the districts. Several Indian Syndicates are working the mines. The Central Provinces Prospecting Syndicate, the Central India Mining Company, the Nagpur Manganese Syndicate, the Satak Manganese Co., Messrs. Byramji Pestonji & Co., and a few others are the principal ones ; the Satak Mines alone yield an annual supply of about 25,000 tons of ore. Messrs. Byramji Pestonji & Co. of Nagpur have constructed a proprietary tramway line for the conveyance of this ore. This single industry has provided work for thousands of workmen.

UNITED PROVINCES.

The Upper India Chamber of Commerce has decided to approach Government suggesting that the accounts of the state industrial undertakings be published, in cases where such industries compete with private enterprise.

The Central Hindu College Co-operative Stores, Ltd., has been started by the students, of the College with the assistance of the Department of Co-operative Societies, U. P. for the supply of provisions and other goods to the students and staff of the

C. H. C. as well as to the members of the Theosophical Society Benares. Shareholders will be entitled to a dividend on share and to a bonus on purchases made.

PUNJAB.

Under the auspices of the Lahore Electric Supply Co., Ltd., of which Messrs. Harkishen Lal, James Curry, Ganpat Rai, Mohan Lal and five other gentlemen are the promoters, preparations are being made for an electric installation for lighting and industrial purposes.

It appears from the Report of the Registrar of Joint Stock Companies, Punjab that "no fewer than 36 (out of 57 Companies registered during 1911-12) are provident societies of the scandalous types for the regulation of which Act V of 1912 was passed". In addition to these 5 banks, a European concern for the exploitation of Rubber, a Company for the supply of electric power to Lahore, a Cotton Ginning Factory established by a few land owners and a sugar factory are the most important.

The following Companies were started in 1912 in the Punjab.

BANKS.

The Indian Exchange Bank, Simla.

Muslin Bank of India, Lahore.

George Bank, Lahore.

National Business and Banking Co., Lahore.

INSURANCE COMPANIES, ETC.

Puthwar Mutual Benefit Society, Kahatei.

Popular Jhang Relief Fund, Jhang City.

Aryavarta Trading Co., Simla.

It is very gratifying to note that Mr. S. Narain, a graduate of the Punjab University, who took up a course of instruction in Cotton Spinning and Weaving at the Municipal school of Technology, Manchester, has by his intelligence and application, passed the Victoria University Final Examination in textile industries carrying the diploma with the title of associate of the Technical

school. Mr. Narain also passed the Honors Examination in Cotton Spinning and Weaving in the first class at the City and Guilds of London Institute and the Board has placed him in the teacher's list, which is indeed a unique distinction for a native of India. He was also elected a member of the Textile Institute, Manchester. On his return to India in 1909, he secured an appointment as manager of the Broach Industrial Mills, where he succeeded in spinning finer counts as high as 85's. This success has led to his appointment on a higher salary in one of the Ahmedabad Mills. Mr. Narain has a very promising career before him.

Mr. Maula Bux of Rawalpindi got a patent for a concave fire grade for facilitating and accelerating the ignition and combustion of coal and other fuel in fire places, stoves &c.

UNITED PROVINCES.

A company has been formed at Lucknow with a capital of 4 lakhs to manufacture wood pulp from Baib Grass for paper making.

MYSORE.

The second session of the Indian Institute of Science at Bangalore, commenced in July last. The following courses have been provided for by the Institute to afford facilities for study and research in pure and applied science for the purpose of bringing it to the aid of existing Indian arts and industries:—

General Chemistry.

Organic Chemistry.

Applied Chemistry.

Electrical Technology.

The Mysore Chemical and Pharmaceutical Work Ltd., has been registered under the Mysore Regulations. Among other things, the Company proposes to do the business of manufacturing chemists, druggists, analytical chemists, wood distillers, distillers of essential oils. The Company will also manufacture soaps, artificial manures, fertilisers, disinfectants &c.

At Dusera Exhibition at Mysore, in the electrical section, the Anglo-American stores, Bangalore Mr. A. S. Andrew had been awarded gold medal for heating and lighting apparatus and another for pumping apparatus and cooking ranges and Messrs. Campbell and Sons received gold medals for their heating and lighting apparatus in chemical industries section. Mr. R. D. Rudrappa, Bangalore, had won gold medals for perfumes.

Following silver medals were awarded:—Mr. Khadparekar for scents ; Mr. Venkatramiah of Tarikers for inks ; the Oriental Soap Factory, Calcutta, for soaps.

Seven bronze medals were also awarded.

In the Art Section gold medals were awarded to Mandal and Company, Calcutta, for harmoniums ; to Spencer and Co., Madras, for best collection of gramophones ; to Karnic and Co., Bangalore, for *veena* and *tamboori* ; to Mr. Dasappa of Mysore for *Mridanga* and to Bahadur Brothers, Bangalore, for best collection of musical instruments.

ASSAM.

It appears from the Report on the flax experiments conducted at Dooriah, during 1910-11 issued as a bulletin of the Agricultural Research Institute, Pusa, that the work has now passed the experimental stage and the experts are now in a position to give advice to cultivators and others who would seek their help.

It is contemplated to start a cotton mill at Harihar or Bangalore as the District it is said is able to supply more than enough cotton for a Spinning and Weaving Mill of 18,000 spindles and 500 looms. The total amount of capital required for this mill is estimated at 12 lakhs of Rupees, of the two places, Harihar is more favourably situated as wood from Mysore forests can be delivered there at Rs. 8 per ton by river.

BARODA.

The Baroda Brush Factory which has commenced its work turns out brushes suitable for various purposes. In Baroda

brush making is carried on as a cottage industry. The backs of brushes, bunches of hair and fibre are provided to the village women, who work in their own houses, return finished brushes, for which they are paid on the piece work system.

The Baroda Glass Works, Ltd., Ornithological and Experimental Farm, Ltd., and the Saraswati Oil Mills Co., Ltd., are the new concerns which have lately started work in the Baroda State. The Glass Works have secured the services of an Indian expert trained in Japan.

A Factory is shortly to be established at Bilimora to manufacture stearine, glycerine and candles.

APPENDIX A.

INDIAN PATENTS.

APPLICATIONS FILED.

Pundit Sheodurshan Dial of Meerut, for a medicine for malarial fever.

Narain Singh of Ferozepore, Punjab, for improvements in perpetual calendars.

Jehangir Sorabji Banaji of Bombay, for improvements in electric dynamo and alternator and current distributing system.

Main Maula Bux of Rawalpindi, for a concave fire grate for facilitating and accelerating the ignition and combustion of coal and other fuel in fire places, kitchen stoves, incinerators and Samavars (water heaters).

Mahadeo A. Kawle of Bombay, for improvements in incandescent petroleum lamps.

Jehangir S. Banaji of Bombay, for improved high efficiency in electric incandescent lamp and holder.

Joy Krishto Biswas of Calcutta, for Joyranee domestic hand-loom.

Elahi Bakhsh of Rawalpindi, for an improved non-breakable polo stick head.

Basanti Charan Sinha of Muzaffarpur, for making hygienic waterproofs.

K. Thulasi Dass of Madras, for water lift.

Virsangappa Patil of Sholapur, for water heater.

Raja Babu, for automatic Chur-a.

Bagh Singh, Kishen Singh and Ladha Singh, for manufacture of chalk pencils.

Ganes Prosad Luchmon Prosad, for Khatta cutting machine.

Mohamed Baksh Ghulam Kadir and Bros., for a lock.

Tej Shankar Kochak and Jagan Nath Prasad, for improved water lift.

G. S. Pelly, for economical deflection weigh bridge.

The Techno Chemical Laboratories, Limited, for improvements in and relating to the treatment of oils, fats and the like.

K. H. Vajifdar, for improvements in or relating to beetle traps.

Roshandin, for the Gurkha ensign football.

D. Ch. Bhan, for Chullah (stove) for cooking chapatis or other native food by means of coal.

H. L. Mandal, for improvements in Toggle Lever Type Jute Bailing Press.

A. M. Sayad, V. R. Kokatnur, G. M. Chiplunkar, G. N. Sahasrabuddhe and D. L. Sahasrabuddhe, for the Bharat steam cooker.

G. W. Day, for cooking apparatus.

Syed Abid Ali, for Sugar Mill.

B. S. Gulam Hussain Sahib, for automatic coach.

N. B. Vaswani, for saving the scientific world the cost of fuel used to work the engine.

Abdul Hamid and Sons, for the hukkah that dispenses with the present cumbrous system of heating it by fire (char-

coal &c.), and is worked by spirit, petroleum candle and oil lamps.

E. D. Tamboli, for improvements in or relating to copping motion for spinning frames.

SPECIFICATIONS.

Dinshawji H. Todiwalla of Bombay, for improvements in mills for grinding sugar.

Mir Nazir Ahmad of Gujranwala, Settlement, for a ploughing machine.

M. Khan of Westminster, for improved shoe for piles made of concrete or other plastic material.

P. Kehr of Calcutta, for improvements in aerating machines for soda-water bottles and the like.

Narain Singh of Ferozepore, Punjab, for improvements in perpetual calendars.

Sayed Ahmad of Poona, for a cooker.

R. R. Khullar, for improvement on the well-known Indian exercise called "Dand".

P. C. Mehta, for an improved fuel briquette.

Krishna Chandra Dass and Jahalal Dhar for self smiths, jewellers and also for general scientific purposes.

E. D. Tamboli, for device for regulating the speed of spinning frames in starting up.

R. Ebrahim, for a bend protector.

B. C. Sinha, for making hygienic water proofs.

S. S. Balasundaram Naiker, for lifting water from wells and tanks and other reservoirs, known as the Automatic Reversing water-lift.

Mian Maula Bux and Allsop, for improvement in flour, sugar or grain crushing stone mills.

D. H. Todiwalla, for improvements in mills for grain.

K. Pandoo, for improvements in incandescent kerosene lamps working under pressure.

Mistri Kuber Moti, for a new design of loom fork.

DESIGNS.

Lakhpatri G. Sadah of Farruckabad, U. P., for a design for printed cotton, wool or silk consisting of buildings, animals, birds and trees in a floral border.

Devi Datto Canyal of Naini Tal, for a design for wooden pieces for building up specified characters, figures (Urdu, Nagri, English) and drawings.

APPENDIX B.

APPENDIX B.

JOINT STOCK COMPANIES REGISTERED DURING THE YEAR.

No.	Class and Name.	Situation of Registered Office.	Object.	Nominal Capital.
	I. BANKING, LOAN AND INSURANCE.			Rs.
	(a) BANKING AND LOAN.			
1	Kalikachha Loan Company	... Tippera, Eastern Bengal and Assam	... Banking and Insurance	10,000
2	Indian Exchange Bank	... Simla, Punjab	... Banking	5,00,000
3	Pioneer Bank	... Bombay	... Do	50,00,000
4	Indian Peninsular Bank	... Hubli, Bombay	... Do	10,00,000
5	Lakshmi Bank	... Poona	... Do	2,50,000
6	Adoni Public Fund	... Bellary, Madras	... Money-lending (mutual)	99,990
7	Tirupati Sri Padma Sarowara Vedasasthra Pat-Sala Nidhi	... Tirupati	... Do	20,000
8	Durbhanga Bank	... Bengal	... Banking	10,00,000
9	Jaunpore Bank	... Jaunpore, U. P.	... Do	5,00,000
10	Deccan Hubli Bank	... Hubli, Bombay	... Do	7,00,000
11	Coonnoor Subramania Vilasa-Upakara Nidhi	... Coonnoor, Madras	... Money-lending (mutual)	1,00,000
12	Muslim Bank of India	... Lahore, Punjab	... Banking &c.	2,50,000
13	Central Bank of India	... Bombay	... Do	50,00,000
14	Malda Banking Company	... Malda, E. B. and Assam	... Banking and loan	1,00,000
15	Crown Bank of India	... Shikarpore (Sind), Bombay	... Do	1,00,000
16	Jain Bank	... Ahmedabad, Bombay	... Do	5,00,000
17	Dhaliyur Lakshmi Vilasa Jana Sagaya Nidhi	... Coimbatore, Madras	... Money-lending (mutual)	1,00,000

18	Karvali Madapore Srimal Thangai-Dhanopakara Nidhi	... Coimbatore, Madras	... Banking and Trading	...	50,000
19	Madras Hindu-Permanent Fund	... Coimbatore, Madras	... Banking	...	1,64,000
20	National Financing and Commission Corporation	... Bombay	... Banking &c.	...	10,000,000
21	Coronation Co-operation Fund	... Bangalore C. & M. Station.	Money-lending	...	20,000
22	Faridpur Bank	... Bengal	Banking and money lending	...	1,20,000
23	George Bank	... Lahore, Punjab	Banking business	...	2,50,000
24	Gaibudha Bank	... Bengal	Do	...	50,000
25	Adambakem Hindu Janopakara Nidhi	... Chingleput, Madras	Do	...	1,23,000
26	Vellore Sri Sarva Janopakara Nidhi (in branch)	... Vellore, Madras	Do	...	1,25,000
27	Bengal Credit Bank	... Bengal	Banking business	...	20,00,000
28	Standard Bank	... Bombay	Do	...	20,00,000

No.	Class and Name.	Situation of Registered Office.	Object.	Nominal Capital.
	(b) INSURANCE.			Rs.
29	Cooperative Trading and Insurance Co.	Silchar, E. B. and Assam ...	Carrying on Insurance and Bank- ing &c. ...	20,000
30	Sarbamangala Gour.sankar Insurance Co. ...	Chittagong, E. B. & A. ...	Carrying on life and marriage Insurance ..	20,000
31	Eastern Bengal Assurance and Provident Fund	Do	Do	25,000
32	National Assurance and Benefit Society ...	Bengal	Life Insurance ...	1,00,000
33	East Cooperative Insurance Co.	Calcutta, Bengal ...	Do	20,000
34	Crown Provident Fund	Bengal	Do	10,000
35	Star of India Insurance Co.	Do	Do	10,00,000
36	Industrial Agency and Insurance Co.	Salkia, Bengal ...	Life and General Agency ...	20,000
37	All-India Provident Fund	U. P. of Agra and Oudh ...	General Insurance ...	20,000
38	Public Sahui Business Co.	Fail, Punjab ...	Making provisions for marriages, &c. ...	50,000
39	Gujranwala Mutual Relief Fund	Gujranwala, Punjab ...	Do	1,00,000
40	Sikh Family Relief Fund	Do	Do	20,000
41	National Relief Corporation of India ...	Sikarpur (Sind), Bombay ...	General Insurance ...	20,000
42	Surnua Valley Pioneer Co.	Silchar, E. B. & A. ...	General Assurance ...	20,000
43	Danoder Provident Fund Co.	Chittagong ...	Do	5,000
44	Crown Assurance Co.	Calcutta, Bengal ...	Life Insurance ...	1,00,000
45	Indian Universal Business Co.	Lahore, Punjab ...	General Assurance ...	10,000
46	Punjab General Business Co.	Piplan, Do	Do	50,000
47	Hindu Helping and Relief Fund	Rawalpindi, Do ...	Do	1,00,000
48	Bannu Coronation Co.	Bannu, N. W. F. P. ...	Do	10,000
49	Decan Mutual Provident Society ...	Poona, Bombay ...	Do	1,00,000
50	Indian Benevolent Provident Society ...	Bengal ...	Provident Insurance ...	20,000

51	Love-Tie Society	... Kidderpore, Bengal	... Provident Insurance	...
52	Indian Economical Insurance Co.	... Bengal	... Insurance	20,000
53	Banga Hitaihi Provident Fund	... Guzra, E. B. & A.	... General Insurance	20,000
54	Alliance Provident Co.	... Calcutta, Bengal	... Life Insurance	20,000
55	Nadia Insurance and Banking Co.	... Do	... Do and Banking	20,000
56	East India Provident Society	... Do	... Life Insurance	20,000
57	Alliance Life Assurance Co.	... Do	... Do	10,00,000
58	Punjab Public Provident Institution	... Amritsar, Punjab	... General Insurance	10,000
59	Globe Trading Co.	... Lahore, Do	... Do	1,00,000
60	Public Benefit Co.	... Kathamisral, Do	... Do	50,000
61	Sukhdaik Hindu Sadi Fund	... Bhera, Do	... Do	50,000
62	Puthwar Mutual Benefit Society	... Kahuta, Punjab	... Do	1,00,000
63	Popular Jhang Relief Fund	... Jhang City, Do	... Do	1,00,000
64	Amolak Marriage and Relief Society	... Multan, Do	... Do	50,000
65	Safety Insurance and Banking Co.	... Sikarpur, Bombay	... Do	1,00,000
66	Southern India Government Security Life Office	... Madras	... Do	1,00,000
67	Sakya Mani Provident Co.	... Guzra, E. B. & A.	... Life and Marriage &c.	10,000
68	Manoranjan Provident Fund	... Chittagong, E. B. & A.	... Do	10,000
69	Kobinoor Life Assurance Co.	... Dacca, E. B. & A.	... Do	20,000
70	Aryasthan Government Security Insurance Co.	... Sylhet, E. B. & A.	... Do Marine &c.	25,000
71	Cachar Insurance Co.	... Silchar, E. B. & A.	... Do	20,000
72	United Assurance Co.	... Calcutta, Bengal	... Life Insurance	1,00,000
73	Indian Family Provident Fund	... Do	... Do	20,000
74	Mahalaxmi Provident Co.	... Benares City, U. P.	... Marriage, Educational Insurance.	20,000
75	National Provident and Banking Co.	... Do	... Carrying on business of Insurance and Banking	50,000
76	National Business and Banking Co.	... Lahore, Punjab	... Do	1,00,000
77	Aryavarta Trading Co.	... Simla, Do	... Do	1,00,000
78	India Assurance Co.	... Calcutta, Bengal	... General Insurance	25,000
79	Unique Assurance Co.	... Do	... Life Assurance	1,00,000
80	Empire Assurance Co.	... Bengal	... Do	20,000

No.	Class and Name.	Situation of Registered Office.	Object.	Nominal Capital.
81	Arya Brothers & Co.	...	...	1,00,000
82	Coronation Insurance and Trading Co.	...	Insurance and General Trade	...
83	George Coronation Assurance and Mutual Benefit Society	Kot Abu, Punjab Silchar, E. B. & A.	General Insurance	20,000
84	Mutual Provident Society of India	Muttra, U. P.	General Insurance	1,00,000
85	Bharat Yatra Trading and Banking Co.	Allahabad, U. P. Multan, Punjab	Do Making Provision for marriage &c.	20,000
86	Sind Punjab Benefit Society	Lahore,	Do	10,000
87	Astamongala Paraspar	Chittagong, E. B. & A.	Marriage Insurance	20,000
88	Sahajya Bhandar	...	...	20,000
89	Chattala Arya Benefit Fund	Do	...	20,000
90	Union Assurance Co.	Bengal	Life and Marriage Insurance	20,000
91	United Bengal Provident Fund	Do	General Insurance	1,00,000
92	Prudential Insurance Company of India...	Calcutta, Bengal	Life Insurance	10,000
93	Sone Sukesar General Business Company.	Manshera, Punjab	Do	20,000
94	Public Vauhar Business Company	Buchhalkhurd, Punjab	General Insurance	50,000
95	Sarb Sadharan Sahaita Bhandar	Ferozepore	Do	50,000
96	Bijaya Provident Fund	Do	Do	20,000
97	Feni Assurance Co.	Bengal	Insurance	10,000
98	Laksmi Narayan Provident Fund Co.	Do	Do	1,000
99	George Empire Assurance Company	Do	Do	10,000
100	Burma Shan Life Stock Insurance Company	Do	Do	1,000
101	Empire of India Provident Society	Rangoon, Burma	Insurance of animals &c	5,00,000
102	Southern Circars Life and Marriage Assurance Company	Bengal	Insurance business	20,000
103	Premier Assurance Co.	Do	Do	20,000
...	...	Do	Do	1,00,000

104	City of Calcutta Insurance and Banking Company	...	Do	...	...	20,000
	II. TRADING. (a) PRINTING, PUBLISHING AND STATIONERY.					
105	Sri Krishn a Chaitanya Tatva Pracharak Company	...	Bengal	...	Printing and publishing Newspapers &c.	10,000
106	Industrial Union	...	Madras	...	Printers, Publishers and Book-sellers	20,000
107	Bihar and Orissa Newspaper	...	Bengal	...	Printing and Publishing Newspapers &c.	3,00,000
108	Christian Patriot Co.	...	Madras	...	Printing, Publishing, &c.	3,000
109	Sahitya Prachar Samiti	...	Calcutta, Bengal	...	Printers and Publishers &c.	20,000
110	Parsi	...	Bombay	...	Publishing Newspapers	1,18,000
	(a) Co-OPERATIVE ASSOCIATIONS.					
111	Guzerat Cultivators Association and Co-operative Trading Agency	...	Broach, Bombay	...	Starting Co-operative stores	1,00,000
112	Co-operative Business Company of India..	...	Dera Ismail Khan, N. W. F. P.	...	Carrying on general trade and Insurance	10,000
113	Popular General Business Company	...	Do	...	Do	10,000
114	Empire Business Co.	...	Do	...	Do	10,000
115	Civil and Military Co operative Society...	...	Dacca, E. B. & A.	...	General trade and manufacturing &c.	2,50,000
116	Burma Railway Co-operative Stores	...	Rangoon, Burma	...	General Trade &c.	20,000
117	Kumarkhali Co-operative Credit Association	...	Bengal	...	General trading and money lending	20,000
118	Lakshmi Narayan Co-operative Stores	...	Rangoon, Burma	...	Starting Co-operative Stores	20,000
119	Bandi-Kui Railway Co-operative Association	...	Rewari, Punjab	...	Do	55,940

No.	Class and Name.	Situation of Registered Office.	Object.	Nominal Capital.
	(b) OTHERS.			
120	Rangoon Manufacturing Co.	... Rangoon, Burma	... Dealing in all kinds of manure, &c.	60,000
121	Warnatoza Co.	... Nyaung labin, Burma	... General Merchants and money lenders	55,000
122	Mc Vicar Smith and Company	... Bengal	... Jute Merchants	3,00,000
123	Luke Stone Bridge and Company	... Calcutta, Bengal	... Electrical, Mechanical and Civil Engineers	3,00,000
124	Lotus Theatre Company	... Do	... Theatre proprietors &c.	1,00,000
125	Mushin Bone Co.	... Benares Cantonment United Provinces	... Trading in hides, bones, &c.	2,00,000
126	Samindar Trading Company	... Sargodha, Punjab	... General Merchants Agents &c.	5,00,000
127	Eureka Porcelain Works	... Lahore, Punjab	... Manufacturing tiles, pipes, pottery &c.	50,000
128	Punjab Commercial Corporation	... Amritsar, Punjab	... Merchants, Agents, and dealers of corns &c.	1,00,000
129	Sahukara Corporation	... Ludhiana, Punjab	... Do	2,50,000
130	R. Wilfred and Co.	... Lahore, Punjab	... Coach-builders and cabinet makers	2,00,000
131	Corn Business Corporation	... Amritsar, Punjab	... Dealing in corn and other goods and Agents	1,00,000
132	Massink and Company	... Rangoon, Burma	... General Merchants, Agents	5,00,000
133	E. Grueber and Company	... Calcutta, Bengal	... Do	3,00,000
134	Kurigram Kamatia Hosiery	... Bengal	... Manufacturing and dealing hosiery &c.	20,000
135	Alipur Duar Surhid Company	... Do	... General Trade	10,000

136 Meerut Supply Association	Meerut, U. P.	General Trade	20,000
137 Pioneer Working Sizing and Manufacturing Company	Bombay	Wrapping yarn and trading	1,00,000
138 Ahmedabad Resham Kasab Co.	Ahmedabad, Bombay	Silk embroiders &c.	50,000
139 Coclin Fisheries	Do	Finishing &c.	1,00,000
140 Naren and Banerji	Bengal	Merchants and Agents	50,000
141 F. F. Christian and Company	Koderma, Bengal	Manufacturing wall papers &c.	3,75,000
142 Industrial Friends	Bengal	General traders	25,000
143 United Medical Stores	Do	Dealing in medicines, drugs &c.	20,000
144 Shikarpur Trading Company	Shikarpur, Bombay	General trade	1,00,000
145 Muthoo and Company	Madras	Merchants and Agents	5,00,000
146 Konthi Akyosung Company	Rangoon, Burma	General trade and agency	1,00,000
147 Sigyi and Company	Do	General merchants, agents	30,000
148 Cachar Industrial Company	Silchar, E. B. and Assam	Trading in hide	1,00,000
149 General Electric Company (India)	Cuttack, Bengal	Mechanical and electrical engineering	7,50,000
150 Behar Trading Corporation	Shahabad, E. B. and Assam	General trading	50,000
151 Bareilly Electric Supply Company	Bareilly, U. P.	Supply electric light	2,00,000
152 Bombay Art Jewellery Works	Bombay	Trading in jewellery	4,00,000
153 Motor Transit and Trading Company	Bimlipatam, Madras	Running motors and trading	1,00,000
154 Madras Engineering Company	Madras	Electrical engineers &c.	30,000
155 Anglo American Drug Company	Do	Chemists and druggists	20,000
156 International Hair Dressing Salon Company	Rangoon, Burma	Carrying on business of hair-dressing	50,000
157 Kashi Provident and Trading Company	Benares City, U. P.	General Trade	10,000
158 India Burma Trading Company	Madras	Banking and trading	5,00,000
III. MILLS AND PRESSES.			
159 Palamedu Thirumagal Vilara Mills	Coimbatore, Madras	Milling rice, Ginning Cotton	25,000
160 Madras Company	Madras	Spinning and Weaving Cotton	3,00,000
161 Elgin Mills Company	Cawnpore, U. P.	Manufacturing and selling woolen cloth	82,00,000

No.	Class and Name.	Situation of Registered Office.	Object.	Nominal Capital.
162	Zaminder Ginning Company	... Bhalwal, Punjab	... Ginning, cleaning, Pressing Manufacturing Cotton, &c. ...	3,00,000
163	Sri Ramar Ginning Factory	... Athipalayam, Madras	... Ginning cotton &c. ...	20,000
164	Fort William Jute Company	... Calcutta, Bengal	... Manufacturing, Pressing Jute, &c. ...	24,00,000
165	Satuthampada Company	... Manlineingyan, Burma	... Milling rice	50,000
166	Calcutta Bone Mills Company	... Bengal	... Dealing in bone meal &c. ...	5,00,000
167	Imperial Jute Mills Company	... Calcutta, Bengal	... Manufacturing and dealing in Jute &c. ...	6,00,000
168	Savatram Ramprasad Mills Company	... Akola, Berar	... Spinning, weaving cotton flax, hemp, Jute &c. ...	7,00,000
169	Sriarada Lakshmi Ginning Mills	... Idigarai, Madras	... Milling rice, &c. ...	20,000
170	Nabarkatiya	... Calcutta, Bengal	... Starting Saw mills trading &c. ...	4,00,900
171	New Burma Milling Company	... Rangoon, Burma	... Starting rice and oil mills and trading	5,00,000
IV. MINING AND QUARRYING.				
172	Salin Oil Company	... Rangoon, Burma	... Mining and dealing in oils, coal &c. ...	5,00,000
173	Bombay Screened Coal Supply Company.	... Bombay	... Coal mining	3,00,000
174	Madras Coal Company	... Madras	... Do	2,50,000
175	Tavoy Exploration Syndicate	... Rangoon, Burma	... Dealers in miners' of minerals, &c. ...	1,00,000
176	Myltha Company	... Kalewa, Burma	... Refining earth-oil and trading	1,50,000
177	New Kessurgurah Coal Company	... Calcutta, Bengal	... Mining coal, and manufacturing coke, cement &c. ...	3,00,000

178	Central Dharmaband Coal Company	... Calcutta, Bengal	... Mining and dealing in coal &c. ...	1,00,000
179	Burma Oil Lands	... Rangoon, Burma	... Mining and refining oils &c. ...	40,000
180	Kuchwar Lime and Stone Company	... Bengal	... Quarrying lime stone and manufacturing cement	6,00,000
181	Damra (Reconstructed) Coal Company	... Calcutta, Bengal	... Coal mining &c.	1,75,000
182	Chandra Sekhar Zamindari Company	... Do	... Management and improvement of Zamindari	225
183	Indian Diamond Mining and Mineral Company	... Do	... Mining diamonds and other minerals	60,00,000
184	Indian Mining and Banking Company	... Do	... Developing mining properties and trading in minerals, bullion, &c.	2,50,000
V. TEA AND OTHER PLANTING COMPANIES.				
185	Assam Indigenous Tea Seed Company	... Assam, Lahool, Lakhimpur.	... Manufacturing tea and trading &c.	20,000
186	Khayerbari Tea Company	... Jalpaiguri, Bengal	... Cultivation of tea, coffee, &c. ...	1,50,000
187	Borpatra Tea Company	... Calcutta, Do	... Do	3,00,000
188	Monmohinipur Tea Company	... Bengal	... Do	1,50,000
189	Bengal Doocars National Tea Company	... Do	... Do	2,50,000
190	Seajuli Tea Company	... Calcutta, Bengal	... Manufacturing and trading in tea &c.	2,00,000
191	Assam Bengal Tea and Trading Company	... Bengal	... Cultivation and manufacture of tea and general trade	10,00,000
192	Saybirpara (Dooars) Tea Company	... Calcutta, Bengal	... Planting tea, coffee, &c.	2,50,000
193	Eastern Tea and Trading Company	... Do	... Promoting agriculture, trade, &c.	2,00,000
194	Union Tea and Trading Company	... Bengal	... Cultivation and manufacture of tea	3,00,000
195	Dhekla para Tea Company	... Jalpaiguri, E. B. and Assam	... Planting tea and coffee	1,25,000

No.	Class and Name.	Situation of Registered Office.	Object.	Nominal Capital.
196	Bogabagh Tea Company	... Calcutta, Bengal	Planting tea and coffee	1,60,000
197	Cochin Sholayar Chunam	... Ootacamund, Madras	Cultivation of tea	1,00,000
198	Dr. D. O'Brien's Company	... Calcutta, Bengal	Manufacturing tea, coffee, &c.	2,40,000
199	Luxmi Tea Company	... Bengal	Cultivation and manufacture of tea	2,00,000
200	Betjan Tea Company	... Calcutta, Bengal	Planting tea, coffee &c.	2,40,000
	VI. OTHERS.			
201	Star Theatre	... Calcutta, Bengal	Theatrical performances	2,00,000
202	Elysium Theatre	... Do	Starting theatres &c.	3,00,000
203	George Theatrical and Advertising Co.	... Amritsar, Punjab	Do	20,000

APPENDIX I.
RESOLUTIONS PASSED AT THE FIRST
INDIAN INDUSTRIAL CONFERENCE.

Held at Benares on the 30th December, 1905.

—:0:—

Resolved that this Conference urges the Government of India and all Provincial Governments and administrations, as also the people of India according to their powers and opportunities,—

(1) To found Technical Schools in all large centres for the Industrial education, on an adequate scale, of the Indian people,

(2) To encourage and help Indian manufactures,

(3) And to foster and extend the use of such manufactures in India in preference to foreign goods.

Proposed by the Honourable Munshi Madho Lal (Benares).

Seconded by Mr. A. Chowdhri (Calcutta).

Supported by Mr. N. Subba Rao (Rajahmundry).

II

Resolved that this Conference urges all Provincial Governments and administrations as well as the proprietors and managers of private schools and colleges to add commercial classes, and industrial classes like those of weaving, dyeing, carpentry, &c., to the existing educational institutions where practicable.

Proposed by Mr. G. Subramania Iyer (Madras).

Seconded by Mr. Ali Mahomed Bhimji (Bombay).

III

Resolved that this Conference specially invites the attention of Indian capitalists to the great importance of introducing the use of improved hand-looms among the weavers of India, and recommends the establishment of weaving schools where boys may learn the use of such looms, with a view to their more extended use among the towns and villages of all Provinces in India.

Proposed by Mr. Prabhas C. Mitra (Calcutta).

Seconded by Mr. Babulal Govika (Aligarh).

Supported by Mr. Fazlal Hassain (Aligarh).

IV

Resolved that this Conference urges Indian capitalists to establish at their own cost schools for spinning, dyeing, pottery, carpentry and the manufacture of ironware and brassware, in order to afford facilities to boys of all castes and classes to learn such useful industries as a means of their livelihood.

Proposed by Rai Bahadur Lala Baij Nath (Allahabad).

Seconded by Pandit Rambhaji Dutt Chowdhri (Lahore).

Supported by Mr. L. R. Das (Calcutta).

V

Resolved that where it is possible to raise large funds for Industrial education, this Conference recommends the placing of such funds in the hands of trustees with a view to the establishment of Technological Colleges on the most modern methods adopted in Europe, America and Japan for the training of large numbers of students in the various industries which are profitable in India.

Proposed by Sir Bhalechandra Krishna, *Kt.* (Bombay).

Seconded by Rai Saheb Lala Girdhari Lal (Delhi).

Supported by Mr. Lukhbir Singh (Muzaffarnagar).

VI

Resolved that Provincial Committees be established in Bengal, Bombay, Madras, the United Provinces, the Punjab, and the Central Provinces and Berar consisting of the members named below for giving effect to the above recommendations generally encouraging industries and making an industrial survey in their several provinces and compiling useful facts and suggestions for submission to the next Industrial Conference in December 1906. In order to carry out these views each Committee is requested to raise suitable funds, appoint trustees, frame rules for the conduct of business and lay their accounts before the next Industrial Conference.

Resolved that following gentlemen be the members of the Provincial Committees for the year 1906, with power to add to their number :—

BENGAL.

T. Palit, Esq.

The Honourable Mr. J. Chawdhari.

R. N. Mookerji, Esq.

BOMBAY.

D. E. Wacha, Esq.

The Honourable Mr. Vithaldas D. Thackersey.

Lallubhai Samaldas, Esq.

MADRAS.

N. Subba Rao, Esq.

The Hon'ble Mr. L. A. Govindaraghava Iyer.

V. Krishnaswami Iyer, Esq.

UNITED PROVINCES.

Rai Bahadur Lala Baij Nath.

The Honourable Pandit Madan Mohan Malaviya.

Munshi Ganga Prasad Varma.

THE PUNJAB.

Rai Bahadur Lala Ganga Ram, C. I. E.

Shaikh Umar Baksh.

Lala Harkishenlal.

Lala Lajpat Rai.

Lala Mulkaraj.

CENTRAL PROVINCES AND BERAR.

Rao Bahadur R. N. Mudholkar.

G. S. Khaparde, Esq.

M. V. Joshi, Esq.

Proposed by Lala Lajpat Rai (Lahore).

Seconded by Rai Bahadur Ganga Ram (Lahore).

Supported by the Honourable Mr. L. A. Govindaraghava
Iyer (Madras).

VII

Resolved that this Conference appoints Rao Bahadur R. N. Mudholkar as General Secretary, empowers the President to appoint a permanent Assistant Secretary and establishment on suitable pay and allots a sum of Rs. 5,000 for meeting the expenses of the next twelve months.

Proposed by the Honourable Pandit Madan Mohan Malaviya (Allahabad).

Seconded by Mr. C. Vijayaraghavachariar (Salem).

BENARES,
The 30th December, 1905.

R. C. DUTT,
President.
R. N. MUDHOLKAR,
General Secretary.

RESOLUTIONS PASSED AT THE SECOND INDIAN INDUSTRIAL CONFERENCE.

Held at Calcutta on the 29th and 31st December, 1906.

1. TECHNICAL AND COMMERCIAL EDUCATION.

RESOLVED—That this Conference re-affirms the Resolution passed at the Conference of last year on the subject of Technical and Commercial Education, and requests the Government to establish a sufficient number of Secondary Technical and Commercial School, a superior Technical College for each Province, and one fully equipped first class College of Technology for all India. And that a Committee consisting of the President, the General Secretary, Messrs. R. C. Dutt, D. E. Wacha, G. V. Joshi, G. Subramania Iyer, Lajpat Rai, P. N. Bose, A. C. Sen, Deva Prasad Sarvadhikari, and Dr. Nil Ratan Sircar, be appointed to prepare a Memorial on the above lines for submission to Government by the President and the General Secretary.

Proposed by V. Krishnaswami Iyer, Esq. (Madras).

Seconded by Deva Prasad Sarvadhikari, Esq. (Calcutta).

Supported by Babu Ambica Charan Maitra, (Pabna).

,, G. A. Natesen, Esq. (Madras) and carried
unanimously.

II. THE INDIAN STORES COMMITTEE.

RESOLVED—That this Conference conveys its thanks to the Government of India for appointing a Committee for making recommendations for the use by Government department of indigenous articles in preference to foreign goods, and requests that they be pleased to direct the early publication of the Report of the Committee, so that the public and the trades in India may have an opportunity of considering it before final orders are passed on the subject.

Proposed by Sir Bhalchandra Krishna (Bombay).

Seconded by K. Natarajan Esq. (Bombay).

Supported by Moulvie Mahommad Nizambuddin Hassan.
(Lucknow) and carried unanimously.

III. INDUSTRIAL SURVEY.

RESOLVED—That in view of the importance of having an Industrial Survey of India made by Government, and having regard to the recommendation made by the Committee on Industrial Education to that effect, this Conference requests Government to make such a survey and empowers the President and the General Secretary to submit a memorial on the subject.

Proposed by Rao Bahadur R. N. Mudholkar (Amraoti).

Seconded by Bibrodas Pal Chowdhuri, Esq. (Calcutta).

Supported by S. C. Mookerjee, Esq. (Calcutta), and carried unanimously.

IV. SUGGESTIONS TO THE PUBLIC.

RESOLVED—That this Conference specially invites the attention of the public to the great importance of introducing the use of improved hand-loom among the weavers of India, of promoting technical education by the establishment of schools and classes, and of starting laboratories for the purpose of determining the industrial value of Indian products.

Proposed by Dewan Bahadur Ambalal S. (Ahmedabad).

Seconded by Vishwanath P. Vaidya, Esq. (Bombay).

Supported by Dr. Nil Ratan Sircar, (Calcutta).

Supported by Shet Damodardas Khivraj (Beawar) and carried unanimously.

V. THE CONFERENCE PROVINCIAL COMMITTEES.

RESOLVED—That the Provincial Committees already established be asked besides taking steps to promote industries in their several provinces, to compile useful facts and suggestions

for submission to the next Industrial Conference, and to raise suitable funds for carrying on their work.

Proposed by Dewan Bahadur L. A. Govindaraghava Iyer
(Madras).

Seconded by Babu Ambica Charan Ukil (Calcutta).

Supported by A. Ramanna, Esq. (Mysore) and carried
unanimously.

VI. APPOINTMENT OF OFFICE-BEARERS AND PROVISION OF FUNDS FOR THE YEAR 1907.

RESOLVED—That this Conference re-appoints Rao Bahadur R. N. Mudholkar as General Secretary and Mr. C. Y. Chintamani as Assistant Secretary, and empowers the President and the General Secretary to appoint an additional Assistant Secretary and establishment on suitable pay, so that the Assistant Secretary may be free to visit the different provinces and help the Provincial Committees in all matters in which they may require assistance. And this Conference allots a sum of Rs. 10,000 for meeting the expenses for the next twelve months, and also for issuing a quarterly bulletin of industrial information under suitable management.

Proposed by R. C. Dutt, Esq., C. I. E., (Baroda).

Seconded by Rai Bahadur P. Ananda Charlu, C. I. E.,
(Madras) and carried unanimously.

VITHALDAS D. THACKERSEY,
President.

R. N. MUDHOLKAR,
General Secretary.

RESOLUTIONS PASSED AT THE THIRD INDIAN INDUSTRIAL CONFERENCE.

Held at Surat on the 30th December, 1907.

I. INDUSTRIAL SURVEY.

RESOLVED—That this Conference expresses its sense of satisfaction that an Industrial Survey has been carried out in the United Provinces and is being carried out in the Central Provinces and Berar, and in the Baroda State ; and it would urge other Provincial Governments in British India and the Governments of other Indian States to carry out at an early date Industrial Surveys of the territories within their jurisdiction as exact and detailed information would afford facilities for the introduction of a sound system of technical education and the well-ordered development of indigenous industries.

(Proposed by Sir Bhalchandra Krishna, Kt., of Bombay, seconded by K. Natarajan, Esq., of Bombay, and carried unanimously.)

II. TECHNICAL AND COMMERCIAL EDUCATION.

RESOLVED—(a) That this Conference re-affirms the Resolution on Technical and Commercial Education passed at the last Conference.

(b) That this Conference thanks the Government of the United Provinces for the action taken by them with a view to introduce a fairly comprehensive system of Technical Education in those Provinces and would express the hope that other Provincial Governments will be pleased to convene representative conferences such as the recent Naini Tal Conference to devise measures for the spread of Technical Education in their respective provinces. And this Conference further expresses the hope that the Government of India would provide adequate funds for giving effect to the recommendations of the Naini Tal Conference and carrying out similar schemes in other provinces.

(c) That this Conference, while appreciating the action taken by the Governments of some Indian States to encourage

Technical Education, urges that further steps should be taken in the same direction in all Indian States.

(d) That this Conference welcomes the growth of public interest in Technical Education as shown by the action taken by certain local and municipal boards and private associations in promoting it, and it strongly urges on the leaders of the people the necessity of taking practical steps for providing increased facilities for it by starting institutions and founding scholarships to encourage technical studies in India and abroad.

(Proposed by R. C. Whitenack, Esq., of Baroda, seconded by D. G. Dalvi, Esq., of Bombay, supported by Ishwar Das Varshini, Esq., of Aligarh and Professor Ruchi Ram Sahni of Lahore, and carried unanimously).

III. AGRICULTURAL EDUCATION.

RESOLVED—That this Conference records its sense of appreciation of the action taken and contemplated by the Government in regard to the establishment of Agricultural Colleges in the several provinces, and would urge that in view of the importance of a wider spread among the cultivating and landholding classes of a practical knowledge of the principles of scientific agriculture and modern methods, Government would be pleased to establish Experimental and Demonstration Farms as widely as possible, and to start vernacular schools in connection with them one at least in every district.

(Proposed by G. Subramania Iyer, Esq., of Madras, seconded by Rao Bahadur Khandubhai Desai of Surat, and carried unanimously).

IV. AGRICULTURAL BANKS.

RESOLVED—That this Conference begs to call the attention of Government to the urgent need of promoting the establishment of Agricultural Banks to help co-operative credit societies and to advance loans directly to agriculturists at reasonable rates of interest, and further begs to suggest that the advice and co-operation of representative members of the Indian

community may be enlisted in devising a suitable scheme to secure this object.

(Proposed by Rao Bahadur Lalshankar Umiashankar* of Ahmedabad, seconded by Thakorram Kapilram, Esq., of Surat, and carried unanimously.)

V. THE MINING INDUSTRY.

RESOLVED—(a) That this Conference expresses its sense of satisfaction at the successful formation of the Tata Iron and Steel Company Limited, with the help entirely of capital raised in India.

(b) That this Conference invites the attention of capitalists in India to the urgent need of developing and fully utilising the mineral resources of the country and trusts that in view of the ultimately lucrative character of the industry they will make organised efforts in that direction.

(c) That this Conference is of opinion that special consideration should be shown to Indian enterprise and initiation by the Government and preferential treatment given to it.

(Proposed by Rao Bahadur R. N. Mudholkar of Amraoti, seconded by the Honourable Mr. Gokuldas K. Parekh of Bombay, and carried unanimously.)

VI. COTTON SPINNING AND WEAVING.

RESOLVED—(a) That this Conference records its sense of satisfaction at the stimulus the Spinning and Weaving industries have received from the Swadesi movement and it urges the bestowal of increased attention on cotton cultivation, the erection of Spinning and Weaving Mills at suitable centres, and the revival of the Hand-loom Weaving Industry on a commercial basis, as essential to the success of the movement.

(b) That this Conference urges the Government to remove the restrictions retarding the expansion of the industry and to provide facilities for affording practical instruction in weaving

by the establishment of Weaving Schools at every important weaving centre.

(Proposed by L. K. Tulasiram, Esq., of Madura, seconded by S. B. Sankaram, Esq., of Ellore, and carried unanimously.)

VII. THE SUGAR INDUSTRY.

RESOLVED—(a) That this Conference notices with concern the increase in the imports of foreign sugar, and is of opinion that to arrest the steady decline of the indigenous industry, it is absolutely necessary to encourage the cultivation of healthier and more prolific varieties of cane, to employ greater care in cultivation, to use more economical processes for extracting the juice, and, above all, to adopt the most modern and efficient methods of refining.

(b) That this Conference urges the Government to provide more extensive irrigational facilities, to allow the utilisation of bye-products and, further, to consider the desirability of imposing a duty upon imported sugar in order to protect the indigenous industry.

(Proposed by the Honourable Pandit Madan Mohan Malaviya, of Allahabad, seconded by Manubhai Nandshankar, Esq., of Baroda, supported by Lala Dharamdas Suri of Lahore and Chhnilal Vrijbhukandas, Esq., of Bombay, and carried unanimously.)

VIII. APPOINTMENT OF OFFICE-BEARERS AND PROVISION OF FUNDS FOR THE YEAR 1908.

RESOLVED—That this Conference re-appoints Rao Bahadur R. N. Mudholkar as General Secretary and Mr. C. Y. Chintamani as Assistant Secretary, and it appears to the public for a sum of Rs. 10,000 for meeting the expenses for the next twelve months.

(Proposed by Sir Bhalchandra Krishna, Kt., of Bombay, seconded by the Honourable Pandit Madan Mohan Malaviya of Allahabad, and carried unanimously.)

SURAT, <i>The 30th December,</i> 1907.	}	AMBALAL SAKERLAL DESAI, <i>President.</i> R. N. MUDHOLKAR, <i>General Secretary.</i>
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RESOLUTIONS PASSED AT THE FOURTH INDIAN INDUSTRIAL CONFERENCE.

Held at Madras on the 26th and the 27th December 1908.

1. DEPARTMENTS OF INDUSTRY.

Resolved—(a) That this Conference is of opinion that there should be in every province of British India a Department of Industry under a Director of Industries to deal with industrial questions and to be in charge of technical and commercial education as well as industrial instruction ; and that there should be an Advisory Board of qualified persons, not less than one-half of whom should be non-official Indians, who should be consulted on all matters of importance.

(b) that the functions of this Department should include (1) the supply of advice in regard to new industries, (2) the introduction of new or improved methods and processes, (3) the carrying out of investigation and experiments, (4) the development of selected industries, and (5) the organization of industrial and commercial exhibitions ;

(c) that there should be an industrial museum and a bureau of information under the Department of Industry for supply of information to the public on industrial and commercial matters.

(Proposed by D. E. Wacha, Esq., (Bombay), seconded by Rao Bahadur G. Srinivasa Rao, (Madras), supported by R. V. Mahajani Esq., (Akola), and carried unanimously.)

II. TECHNICAL AND INDUSTRIAL EDUCATION.

RESOLVED—That this Conference re-affirms the Resolutions of the previous Conferences on Technical and Industrial Education, and urges (1) that the Victoria Jubilee Technical Institute, Bombay, and the College of Science, Poona, be enlarged so that they may between them supply for the Presidency of Bombay technological instruction in all the branches of mechanical and chemical industries ; (2) that the Government of India may sanction the proposal of the Government of Bengal to add classes in industrial Chemistry to the Sidpur Engineering College ; (3) that Government of Madras will be pleased to give effect to the recommendation of the Ootacamund Industrial Conference that the Madras College of Engineering should be expanded into an Institute of Technology ; (4) that the Secretary of State might accord early sanction to the proposal of the Government of the United Provinces that a College of Technology should be opened at Cawnpore ; and (5) that similar institutions should be established in the Punjab, Burma and Eastern Bengal and Assam.

(Proposed by the Hon'ble Pandit Madan Mohan Malaviya, (Allahabad), seconded by the Hon'ble Mr. Gokuldas K. Parekh, (Bombay), supported by T. Rangachariar, Esq. (Madras), and Lalla Dharam Das Suri, (Lahore) and carried unanimously).

III. COMMERCIAL EDUCATION.

RESOLVED—(a) That in the opinion of this Conference the time has come for the Indian Universities to create faculties of Commerce and institute Degrees in Commerce, and to affiliate Commercial Colleges that will prepare candidates for University Degrees in Commerce ;

(b) that there should be established one College of Commerce at each Provincial capital and that it should include provision for the training of teachers for Commercial Schools in the mofussil.

(Proposed by K. Subramani Aiyer, Esq. (Bombay), seconded by D. G. Dalvi, Esq. (Bombay), and carried unanimously.)

IV. AGRICULTURAL BANKS.

RESOLVED—That this Conference again invites the attention of the Supreme and the Provincial Governments to the urgent need for Agricultural Banks both to assist Co-operative Credit Societies and, in cases where Co-operative Credit Societies cannot or will not serve, to advance loans directly to agriculturists on easy terms, and urges them to take early action in the desired direction in conjunction with Indian capitalists who, the Conference feels confident, would be ready to co-operate with Government in any such scheme.

(Proposed by Lalubhai Samaldas, Esq. (Bombay), seconded by Rao Bahadur Khandubhai G. Desai, (Surat), supported by Rao Bahadur V. K. Ramanujachariar, (Kumbhakonam), and carried unanimously)

V. COTTON EXCISE DUTY.

RESOLVED—That this Conference records its emphatic protest against the continuance of the Excise Duty on Indian mill-made cloth as an unjust and unnecessary impost and urges that it should be removed without delay.

(Proposed by Uttamlal K Trivedi, Esq. (Bombay), seconded by Pandit Rambhuj Dutt Chowdhuri, (Lahore), and carried unanimously.)

VI. RAILWAY RATES ON GOODS.

RESOLVED—That this Conference calls the attention of the Government to the prevailing complaints about existing railway rates, and suggests that an enquiry should be instituted into their effect on indigenous industries especially in their competition with imported goods, and further submits that the rates should be reduced where their effect may be proved to be injurious.

(Proposed by Dewan Bahadur Ambalal S. Desai, (Ahmedabad), seconded by Rao Bahadur Doorao Vinayak, (Akola), and carried unanimously.)

VII. MINING, WEAVING AND SUGAR INDUSTRIES.

RESOLVED—That while expressing its satisfaction at the steady progress of the Swadeshi movement, this Conference, concurring with the last Conference, calls the particular attention of capitalists and the general public to the necessity of developing the Mining, Weaving and Sugar industries, and urges the formation of Joint-Stock Companies for working mines and erecting mills and factories.

(Proposed by the Hon'ble Sir Vithaldas D. Thackersey, Kt. (Bombay), seconded by G. Subramania Iyer, Esq. (Madras), supported by the Hon'ble Mr. H. S. Dikshit (Bombay), and carried unanimously.)

OFFICE BEARERS AND FUNDS FOR NEXT YEARS.

RESOLVED—That this Conference re-appoints Rao Bahadur R. N. Mudholkar as General Secretary and Mr. C. Y. Chintamani as Assistant Secretary for the year 1909, and appeals to the public for a sum of Rs. 5,000 to meet the next twelve months.

(Proposed by N. Subba Rao Pantulu, Esq. (Rajahmundry), seconded by Babu Gunga Prasad Varma (Lucknow), and carried unanimously.)

MADRAS, <i>The 27th December, 1908.</i>	}	R. N. MUDHOLKAR, <i>President.</i>
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RESOLUTIONS OF THE FIFTH INDIAN INDUSTRIAL CONFERENCE.

Held at Lahore on the 30th December 1909.

I. DEATH OF MR. R. C. DUTT.

RESOLVED—That this Conference places on record its profound sorrow for the sad death of its first President, the late Mr. Romesh Chandra Dutt, C. I. E. The Industrial movement has lost in him one of its ablest and most zealous champions, and the country, one of her most accomplished, earnest and patriotic sons. That this Conference authorizes the General Secretary to convey the above Resolution to the widow and son of Mr. Dutt.

II. PURCHASE OF STORES BY GOVERNMENT DEPARTMENTS.

RESOLVED—That this Conference thanks the Secretary of State and the Government of India, for the orders, which have been recently issued in regard to the purchase by Government Departments of articles, made in India, in preference to those of foreign manufacture. The Conference while recognising the fact these orders mark a distinct advance in the policy of Government towards the encouragement of indigenous industries and manufactures is of opinion that the report of the Committee be published for general information and guidance in the future.

III. TECHNICAL AND INDUSTRIAL EDUCATION.

RESOLVED—That this Conference regrets that the proposal of the United Provinces Government for the establishment of a Technological College at Cawnpore, which was supported by the Government of India, has not been sanctioned by the Secretary of State. In view of this fact this Conference reaffirms the Resolutions of the previous Conference on Technical and Industrial Education and again urges:—

(1) that the Victoria Jubilee Technical Institute of Bombay, and the College of Science at Poona, be enlarged so that they may between them supply for the Presidency of Bombay technological instruction in all the branches of mechanical and chemical industries ;

(2) that the Government of India may sanction the proposal of the Government of Bengal to add classes in Industrial Chemistry to the Sibpore Engineering College ;

(3) that the Government of Madras will be pleased to give effect to the recommendation of the Ootacamund Industrial Conference that the Madras College of Engineering should be expanded into an Insitute of Technology ;

(4) that the Secretary of State might accord early sanction to the proposal of the Government of the United Provinces that a College of Technology should be opened at Cawnpore ; and

(5) that similar Institutions should be established in the Punjab, Burma, Eastern Bengal and Assam.

IV. COMMERCIAL EDUCATION.

RESOLVED—(*a*) That in the opinion of this Conference the time has come for the Indian Universities to create Faculties of Commerce and institute degrees in commerce and to affiliate Commercial Colleges that will prepare candidates for University degrees in commerce ;

(*b*) that there should be established one College of Commerce in each provincial capital and that it should include provision for the training of teachers for Commercial Schools in the mofussil.

V. AGRICULTURAL BANKS.

RESOLVED—That the Conference again invites the attention of the Supreme and Provincial Governments to the urgent need of establishing Agricultural Banks for assisting the existing Co-operative Credit Societies and for advancing loans direct to agriculturists on easy terms wherever such societies do not exist, with the view of ameliorating the economic condition of the Indian peasantry.

VI. COTTON EXCISE DUTY.

RESOLVED—That the Conference records again its emphatic protest against the continuance of the Excise duty on Indian mill-made cloth as an unjust and unnecessary impost which presses heavily on the industry, and pays that it should be abolished at the earliest opportunity.

VII. WEIGHTS AND MEASURES.

RESOLVED—That this Conference invites the attention of the Government of India to the desirability of introducing uniform weights and measures to facilitate trade among the different towns and provinces of India, to prevent fraudulent practices of traders and remove the present inconveniences arising from a multiplicity of weights and measures and from a want of uniform system and standard.

VIII. OFFICE-BEARERS AND FUNDS FOR NEXT YEAR.

RESOLVED—That this Conference re-appoints Rao Bahadur R. N. Mudholkar as General Secretary and authorizes him to appoint an Assistant Secretary with suitable establishment and appeals to the public for a sum of Rs. 5,000 to meet the expenses of the next twelve months.

RAMESHWAR SINGH,
President.

30th December 1909. } **R. N. MUDHOLKAR,**
General Secretary.

RESOLUTIONS OF THE SIXTH INDIAN INDUSTRIAL CONFERENCE.

Held at Allahabad on the 30th December 1909.

I. VOTE OF SORROW FOR THE DEATH OF HIS LATE MAJESTY, KING-EMPEROR, EDWARD VII.

RESOLVED—That this Conference places on record its profound sorrow at the death of His Late Majesty King-Emperor, Edward VII, in whom the people of India have lost a most sympathetic and warm hearted well-wisher and supporter, the Empire a wise and benevolent sovereign and the world a powerful promoter of peace and general amity, and respectfully tenders its condolence to Her Majesty Queen-Empress, Alexandra and the members of the Royal Family.

(Put from the Chair in solemn silence, the whole audience standing and carried unanimously.)

II. HOMAGE TO HIS MAJESTY, KING-EMPEROR, GEORGE V.

RESOLVED—That this Conference begs to offer its respectful and loyal homage to His Majesty King-Emperor, George V, on his accession to the throne of the British Empire, and expresses the hope that His Majesty's gracious sympathy for the people of this country and interest in their well-being will effectively promote their prosperity and advancement.

(Moved from the Chair and carried unanimously and by acclamation.)

III. TECHNICAL EDUCATION.

RESOLVED—(a) While gratefully acknowledging the grants to technical and industrial education made by Government in recent years, this Conference places on record its firm conviction that, for effectively promoting the industrial progress of this country, it is essential that the Government should establish here at least one fully equipped Polytechnic College for imparting the highest kind of instruction in the applied sciences and industrial arts, and further urges that the visit of His Majesty, King-Emperor, George V and Her Majesty, Queen-Empress, Mary should be commemorated by the foundation of such an institution.

(b) This Conference also invites business, scientific and technical experts to form themselves into a working organization for the creation of a scientific, technological and commercial literature in the Indian Vernaculars for the dissemination of information on industrial and commercial subjects amongst the people of India.

(Proposed by Sir Bhalchandra Krishna, Kt. of Bombay, seconded by Pandit Gokarnanath Misra of Lucknow, supported by Babus Laxmi Chand and Thakur Prasad and carried unanimously.)

IV. COMMERCIAL EDUCATION.

RESOLVED—(a) In the opinion of this Conference the time has come for the Indian Universities to create Faculties of Commerce to institute Degrees in Commerce, and to affiliate Commercial College, which will prepare candidates for such Degrees.

(b) That there should be established one College of Commerce in each provincial capital and that it should include provision for the training of teachers for commercial schools in the mofussil.

(Proposed by Mr. C. Gopal Menon of Madras, seconded by Mr. Gulabchand Javeri and carried unanimously.)

V. EXCISE DUTY ON COTTON GOODS.

RESOLVED—This Conference again records its emphatic protest against the continuance of the Excise Duty on Indian mill-made cloth as an unjust and unnecessary impost which presses heavily on the industry and prays that it should be abolished at the earliest opportunity.

(Proposed by the Honourable Mr. Gokuldas K. Parekh of Bombay, seconded by Mr. Mathuradas Ram Chand Javeri of Sind, supported by Mr. Mawjee Govindjee Sheth of Bombay and carried unanimously.)

VI. THE INDIAN FACTORIES BILL.

RESOLVED—This Conference is of opinion that the provisions of the Indian Factories Bill of 1909 involve a serious, unnecessary and uncalled for interference with the rights of adult male labour and urges that the sections of the Bill which involve such restriction be dropped.

(Proposed by the Honourable Sir Vithaldas D. Thackersey, seconded by Mr. D. E. Wacha, supported by the Honourable Rao Bahadur R. N. Mudholkar and carried unanimously. Two amendments were proposed but they were lost.)

VII. MERCHANDISE MARKS ACT.

RESOLVED—This Conference draws the attention of Government to the use, on several articles manufactured outside India, of misleading descriptions, impressions, or marks calculated to cause the belief among purchasers and consumers that the same were made in India and urges that steps be taken, by legislation, if necessary to prevent such and similar fraudulent practices by requiring in every case the indication of the country of origin.

(Proposed by Mr. M. B. Sant, of Amraoti, seconded by Mr. J. P. Kotilingam of Madras, and carried unanimously.)

VIII. WEIGHTS AND MEASURES.

RESOLVED—This Conference re-affirms Resolution No. VII of last year's Conference and again invites the attention of the Government of India to the desirability of introducing uniform

weights and measures to facilitate trade among the different towns and provinces of India, and remove the present inconveniences arising from a multiplicity of weights and measures and from a want of uniform system and standard.

(Proposed by the Honourable Rao Bahadur R. N. Mudholkar, seconded by Mr. Goswami Brijnath and carried unanimously.)

IX. AGRICULTURAL BANKS.

RESOLVED—This Conference notes with regret that the Secretary of State has not sanctioned the scheme drawn up by some of the leading financiers of Bombay of an Agricultural and Industrial Bank, though the same had received the support of the Government of Bombay and the Government of India, and again urges upon Government its conviction that for securing an amelioration of the economic condition of the peasantry and the land-owning classes, it is necessary to establish agricultural banks for assisting the existing Co-operative Credit Societies and for advancing loans direct to agriculturists wherever such societies do not exist.

(Proposed by Mr. G. K. Devadhar of Poona, seconded by Mr. Mahesh Charan Sinha. Babu Ambica Charan Ookil moved an amendment which the President ruled out of order. The original resolution was carried unanimously.)

X. JOINT STOCK COMPANIES.

RESOLVED—This Conference considers that it is desirable to bring the law regulating Joint Stock Companies in India in a line with the law in England, as laid down in the recent Companies Consolidation Act, with such modifications as will suit the circumstances of this country.

(Proposed by Mr. J. K. Mehta of Bombay, seconded by Mr. B. F. Karbhari and carried unanimously.)

XI. ABOLITION OF THE DEPARTMENT OF INDUSTRIES.

RESOLVED—This Conference records its sense of deep regret at the action of the Secretary of State in directing the abolition

of the Department of Industries in Madras and lodges a protest against the policy laid down by him that the State should not pioneer new enterprises, as unduly limiting State help in industrial development.

[Proposed by Mr. C. Y. Chintamani, of Allahabad, seconded by the Honourable Sir Vithaldas D. Thackersey, and carried unanimously.]

XII. DUTY ON SUGAR.

RESOLVED.—This Conference is strongly of opinion that it is essential that the Government should impose an adequate import duty on foreign sugar in order to enable the indigenous industry to hold its own.

(Proposed by the Honourable Rai Bahadur Ramanuj Dyal, seconded by Mr. J. P. Kotilingam and carried unanimously.)

A resolution on Octroi Duty levied in some parts of India was moved but its consideration was postponed owing to a difference of opinion.

XIII. APPOINTMENT OF OFFICE-BEARERS AND APPEAL FOR FUNDS.

RESOLVED.—That the Conference re-appoints the Honourable Rao Bahadur R. N. Mudholkar as General Secretary and authorizes him to appoint an Assistant Secretary with suitable establishment and appeals to the public for a sum of Rs. 5,000 to meet the expenses of the Industrial Conference Office for the next twelve months.

(Proposed by the Honourable Pandit Madan Mohan Malaviya, seconded by Babu Ganga Prasad Varma and carried unanimously.)

R. N. MOOKERJEE,
President.

ALLAHABAD,
The 30th December 1909.

}

R. N. MUDHOLKAR,
General Secretary.

RESOLUTIONS.

PASSED AT

**The Seventh Indian Industrial Conference,
Held at Calcutta on the 29th December, 1911.**

RESOLUTION I.

Homage to Their Imperial Majesties.

The Indian Industrial Conference assembled in its seventh Session humbly and respectfully tenders its most dutiful and loyal homage to Their Imperial Majesties King-Emperor George V and Queen-Empress Mary on the occasion of Their visit to India to graciously announce in person the solemnities of Their coronation to Their faithful and loving subjects in this country. The Conference begs to express its grateful rejoicings at the benign assurances of sympathy and regard given in the Royal Proclamation and the boons bestowed upon the people to promote their happiness and prosperity and secure their contentment and attachment.

Moved from the Chair.

RESOLUTION II.

The late Honourable Mr. V. Krishna Swamy Iyer.

The Conference expresses its profound sorrow at the sad and untimely death of the Honourable Mr. V. Krishna Swamy Iyer, C. S. I., Member of the Executive Council of His Excellency the Governor of Madras, in whom it has lost one of its most zealous and active supporters, the country one of her best and noblest sons and the British Empire a most loyal and devoted citizen. The Conference authorizes the General Secretary to convey its sincere and heartfelt condolence to the son and relations of the deceased gentleman.

Moved from the Chair.

RESOLUTION III.

Technical Education.

While expressing its appreciation and thankfulness to the Government for the liberal action taken and contemplated, in regard to Technical Education, this Conference once more records its firm conviction that for placing the cause of industrial progress on a firm basis, it is most necessary that the Government should establish in the country at least one fully-equipped Polytechnic College for imparting the highest kind of instruction in the applied sciences and industrial arts and further urges that the visit of Their Imperial Majesties the King-Imperor and the Queen-Empress should be commemorated by the foundation of such an institution bearing Their names.

Proposed by—MR. A. CHOWDHARI, (Bengal).

Seconded by—MR. S. K. NAIR, (Madras).

Supported by—MR. L. V. KAIKINI, (Berar).

RESOLUTION IV.

• **Failure of Industrial Enterprises.**

This Conference notes with regret and concern the failure of several industrial enterprises started for carrying on new industries and the effect these failures have produced in damping the ardour of the people in the development of the resources of the country. The Conference calls upon the leaders of the people in the different Provinces and Districts to institute inquiries into the causes of these failures and authorises the General Secretary to depute one or more persons or securing this investigation.

Proposed by—THE HON'BLE MR. R. P. KARANDIKAR,
(Bombay).

Seconded by—RAO BAHADUR V. R. PANDIT, (C. P.).

Supported by—MR. K. S. NARAIN RAO (Madras).

RESOLUTION V.

Railway Rates.

This Conference calls the attention of the Government to the prevailing complaints about the anomalous character of the existing Railway rates on goods and their unfairly heavy incidence on interprovincial trade and urges the necessity of laying down for interprovincial consignments the same scales of rates as those for consignments to and from important ports.

Proposed by—MR. N. A. DRAVID, (Berar).

Seconded by—MR. L. V. KAIKINI (Berar).

RESOLUTION VI.

Purchase of Government stores.

This Conference urges upon the leaders of the different Provinces the necessity of vigilance to secure the effectual and complete carrying out of the orders of the Government issued in 1909 for the purchase of Government Stores in this country as far as practicable, and appoints a committee consisting of the following gentlemen to watch the operation of the rules and to report thereon to the next Conference :—

Sir R. N. Mookerjee

Mr. D. E. Wacha

Honourable Sir Vithaldas D. Thackersey

Honourable Mr. Lalubhai Samaldas

Dewan Bahadur P. Rajaratnam Mudaliyar

Lala Harkishen Lal

The Honourable Rao Bahadur R. N. Mudholkar.

Proposed by—THE HONOURABLE RAO BAHADUR R. N.
MUDHOLKAR, (Berar).

Seconded by—PROF. R. K. MOOKERJEE (Bengal).

RESOLUTION VII.

Director of Industries.

This Conference once more urges that there should be in every Province of British India, a department of industry under a Director of industries to deal with industrial questions and to be in charge of Technical and Commercial education as well as Industrial instruction ; and that there should be an advisory board of qualified persons not less than one half of whom should be non-official Indians, who should be consulted on all matters of importance ; that the functions of this department should include (1) the supply of advice in regard to new industries, (2) the introduction of new or improved methods and processes, (3) the carrying out of investigation and experiments, (4) the development of selected industries, (5) the organisation of industrial and commercial exhibitions.

(6) That there should be an Industrial Museum and a bureau of information under the Department of Industry for supply of information to the public on Industrial and Commercial matters.

Proposed by—MR. C. Y. CHINTAMANI, (U. P.).

Seconded by—MR. KALOORAM GANGRADE, (Central India).

RESOLUTION VIII.

Co-operative Banks.

This Conference welcomes the establishment in the Bombay Presidency of a Central Co-operative Bank and urges upon the Government and the people the desirability of establishing similar Banks in the other Provinces to help Co-operative Credit Societies and to advance loans directly to agriculturists at reasonable rates of interest.

Proposed by—THE HON'BLE SIR GANGADHAR RAO CHITNAVIS, (Berar).

Seconded by—RAO BAHADUR G. SHRINIVAS RAO, (Madras).

RESOLUTION IX.

Indentured Labour.

This Conference is of opinion that in the highest interests of the country, the system of Indian indentured labour is undesirable and should be abolished and urges the Government of India to take early steps to prohibit the recruitment of Indian labour under contract of indenture, whether for service at home or abroad.

Proposed by—HONOURABLE MR. N. SUBBA RAU, (Madras).

Seconded by—MR. POLAK, (South Africa).

Supported by—MR. PAUL PETER PILLAI, (Madras).

RESOLUTION X.

Duty on Alcohol.

In view of promoting and facilitating the work of Scientific and Technical Instruction in India this Conference urges upon Government the desirability of exempting, in conformity with the practice of other civilized countries, from payment of duty all alcohol purchased by public educational institutions in this country for strictly educational purposes.

Proposed by— MR. MANINDRA NATH BANERJEE, (Bengal).

Seconded by— DR. A. CHATTOPADHYAY, (Bengal).

RESOLUTION XI.

Appointment of Committee.

This Conference appoints a Committee of the following gentlemen to submit opinions on and offer suggestions in regard to the Co-operative Credit Societies' Bill, the Life Assurance Companies' Bill and the Provident Societies' Bill, now pending in the Imperial Legislative Council :—

The Honourable Mr. G. K. Gokhale

The Honourable Sir Vithaldas D. Thackersey.

The Honourable Mr. M. B. Dadabhoy

Sir G. M. Chitnavis

Babu Surendranath Thakur

The Honourable Rao Bahadur R. N. Mulholkar.

Proposed by—MR. J. CHOWDHARI. (Bengal).

Seconded by—PANDIT GOKARNA NATH MISRA, (U. P.).

Supported by—MR. A. C. UKIL, (Bengal).

RESOLUTION XII.

Previous Resolutions.

This Conference confirms the resolutions passed in previous Conferences :—

(1) calling upon the Government and the people (a) to encourage and help Indian manufacturers and (b) to foster and encourage the use of such manufactures ;

(2) inviting the attention of capitalists in India to the urgent need of developing and fully utilising the mineral resources of the country and asking them to make organised efforts in that direction ;

(3) urging the special claims to consideration of the Textile and Sugar Industries ; and praying for the repeal of the excise duty on Cotton goods ;

(4) urging the desirability of the standardisation and unification of weights and measures so as to remove the serious inconveniences caused to trade by their multiplicity ;

(5) urging the Indian Universities to create faculties of Commerce, to institute degrees in Commerce and to affiliate Commercial Colleges which will prepare candidates for such degrees, and recommending the establishment of a College of Commerce in each Provincial Capital, which should also provide for the training of teachers for Commercial Schools in the mofussil.

Proposed by—MR. R. C. BONNERJEE, (Bengal).

Seconded by—MR. V. V. JOGIAH, (Madras).

RESOLUTION XIII.

Office Bearers.

The Hon' ble Rao Bahadur R. N. Mudholkar be appointed General Secretary of the Industrial Conference for the next year, Mr. N. A. Dravid, Honorary Assistant Secretary and Mr. M. B. Sant, Assistant Secretary, and this Conference appeals to the public for a sum of Rs. 5,000 to carry on the work of the Industrial Conference.

This Conference deems it desirable that there should be a Standing Committee of the Conference appointed for each year to co-operate with the General Secretary in carrying on the work of the Conference during the year and to advise on all such matters as the Genral Secretary may submit to them and that the following gentlemen do constitute the Standing Committee for the year 1912 :—

SIR R. N. MUKERJI

MR. J. CHAUDHARI

SIR VITHALDAS D. THACKERSEY

MR. D. E. WACHA

Hon'ble MR. LALUBHAI SAMALDAS

Dewan Bahadur P. RAJARATNAM MUDALIYAR

LALA HARKISHEN LAL

DR. SATISH CHANDRA BANERJEE

MR. C. Y. CHINTAMANI

MR. HASAN IMAM

RAI PURENDU NARAYEN SINHA

The Hon'ble MR. M. B. DADABHOY

Hon'ble Rao Bahadur R. N. MUDHOLKAR, General
Secretary (Ex-officio).

Proposed by—THE HON'BLE PANDIT MADAN
M. MALAVIYA.

Seconded by—RAO BAHADUR R. G. MUNDLE,

M. B. DADABHOY,

President,

Seventh Indian Industrial Conference.

R. N. MUDHOLKAR,

General Secretary,

Indian Industrial Conference.

APPENDIX II.

LIST OF DELEGATES TO THE EIGHTH INDIAN INDUSTRIAL CONFERENCE HELD AT BANKIPORE ON

30TH DECEMBER 1912.

(1) *Elected by the South Indian Association, Madras.*

1. The Honourable Dewan Bahadur L. A. Govinda Raghava Aiyar.
2. The Honourable Mr. T. V. Sheshagiri Aiyar.
3. The Honourable Mr. N. Subba Rao Pantulu.
4. Mr. S. Sirinivas Aiyangar.
5. Mr. T. V. Gopalswami Mudaliar.
6. Mr. S. Gopalswami Aiyangar.
7. Mr. K. B. Ramanadha Aiyar.
8. Mr. C. Gopal Minon.
9. Mr. C. P. Ramswamy Aiyar.
10. Mr. A. Rangaswamy Aiyangar.

(2) *The National Funds and Industrial Association, Madras.*

1. The Honourable Nawab Syed Mahomed Sahib Bahadur.
2. The Honourable Dewan Bahadur L. A. Govinda Raghava Aiyar, B. A. B. L.
3. The Honourable Mr. T. V. Sheshagiri Aiyar, B. A. B. L.
4. Dewan Bahadur Mr. Audinarayaniah Garu.
5. The Honourable Mr. N. Subba Rao Pantulu Garu.
6. Mr. F. Rangachariar, B. A. B. L.
7. Mr. S. Sirinivas Aiyangar, B. A. B. L.
8. Mr. V. R. Nambiar, B. A. B. L.
9. Pandit D. Gopala Charlu A. V. S.
10. Dewan Bahadur Govindas Chatur Bhujdas.
11. Mr. S. Raja Gopala Chariar.
12. Mr. M. R. Ramashesha Aiyar.
13. Mr. T. V. Gopala Swami Mudaliar, B. A. B. L.
14. Mr. Vidya Sagar Panday.
15. Mr. C. Gopal Menon.
16. Mr. A. C. Parthasarathy Naidu.
17. Mr. K. B. Ramanath Aiyar.
18. Mr. D. V. Hamnanath Rao.

(5) *By the Deccan Agricultural Association, Poona.*

1. Sirdar J. B. Potnis.
2. Mr. B. S. Kamat, B. A.

(6) *By the Provincial Committee of the Industrial Conference,
Berar.*

1. The Honourable Rao Bahadur R. N. Mudholkar,
Advocate, Amraoti.
2. Rao Bahadur R. G. Mundale.
3. Rao Bahadur Deorao Vinayak.
4. Rao Bahadur V. M. Mahajani.
5. Mr. R. V. Mahajani.
6. Mr. M. V. Joshi.
7. Mr. B. R. Landge.
8. Mr. M. B. Sant
9. Mr. G. R. Kshirsagar.

(7) *Millowners' Association, Bombay.*

1. The Honourable Sir Vithaldas D. Thackersey, Kt.
2. The Honourable Sir Sassoon David, Bart.
3. Mr. Dinshaw E. Wacha.

(8) *The Indian Merchants' Chamber and Bureau, Bombay.*

1. The Honourable Sir Vithaldas D. Thackersey Kt.
2. Mr. D. E. Wacha.
3. Mr. Golabchand Devchand Javeri.
4. Mr. Piroz Shaw Hormusjee Dayer.

(9) *By the Behar Land-Holders' Association, Bankipore.*

1. Babu Chandrashekhar Prasad Singh.
 2. Honourable Babu Krishna Sahay.
 3. Khan Bahadur Sarfaraz Hussein Khan.
 4. Hon. Maulvi Syed Fakhruddin.
 5. Hon. Maharaja Gopal Saran Narain-Singh.
 6. Babu Harihar Prasad Sing.
 7. Mr. S. Sinha.
 8. Mr. Mazharul Haque.
 9. Babu Maheshwar Prasad.
 10. Mr. Kumar Kalikananda Sinha.
 11. Hon. Mr. Deep Narain Sing.
 12. Hon. Rai Bahadur Siva Sankara Sahay.
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